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PREVENTION AND TREATMENT OF TUBERCULOSIS IN THE ADMINISTRATIVE COUNTY OF LANCASTER.

Report of the Central Tuberculosis Officer
of the Lancashire County Council
for the Year 1929.

C. Tinling & Co. Ltd., Liverpool, London and Prescot.
1930.

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COUNTY TUBERCULOSIS COMMITTEE
(1930).

The Chairman of the County Council:

†H. Wade Deacon, Esq., C.B.E., J.P.

The Vice-Chairman of the County Council:

†J. T. Travis Clegg, Esq., J.P., D.L.

Chairman of Committee:

*†C. J. Trimble, Esq., C.B., C.M.G., L.R.C.S.I., J.P., D.L.

Vice-Chairman:

*E. Boothman, Esq., J.P.

County Aldermen—

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A. S. Bury, Esq., J.P.
*W. Hodgson, Esq., J.P.
R. Sephton, Esq., M.R.C.S., J.P.

County Councillors—

J. A. Birch, Esq.
G. H. Brown, Esq.
*I. Flack, Esq., L.R.C.P., L.R.F.P.S., D.P.H.
*F. H. Hollingworth, Esq.
H. F. Jeffery, Esq., M.B., Ch.B., J.P.
*A. Kenyon, Esq.
W. J. Lucas, Esq.
P. F. Mannix, Esq., M.D., M.Ch., B.A.O., R.U.I.
*Rev. A. M. Mitchell, M.A.
J. Nuttall, Esq.
C. De Lisle Shortt, Esq., L.M., L.S.
*E. G. Woolgar, Esq.

* Members of Sanatorium and Hospital Sub-Committee.

† County Aldermen.

MEDICAL AND NURSING STAFF OF THE TUBERCULOSIS DEPARTMENT, 1930.

G. Lissant Cox, M.A., M.D. (Camb.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), Central Tuberculosis Officer.

Dispensary Areas.

Area No. 1. (Population 261,465).

(Lancaster, Morecambe and Heysham, Lytham St. Annes, Garstang Rural (part), Preston Rural, Walton-le-Dale, Chorley, and Horwich districts).

Consultant Tuberculosis Officer—Alan D. Brunwin, M.A., M.D., B.Ch. (Camb.), D.P.H. (Aberdeen).

Assistant Tuberculosis Officer—George H. Leigh, M.D., Ch.B., D.P.H. (Manch.).

Area No. 2. (Population 354,645).

(Clitheroe, Colne, Nelson, Burnley Rural, Blackburn Rural, Accrington, Darwen, Haslingden, Rawtenstall, and Bacup districts).

Consultant Tuberculosis Officer and Visiting Medical Superintendent, Withnell Pulmonary Hospital—Burgess MacPhee, M.B., Ch.B. (Glas.), D.P.H. (Camb.).

Assistant Tuberculosis Officers—Scott C. Adam, M.B., Ch.B. (Glas.), D.P.H. (Lond.), and F. C. S. Bradbury, M.B., B.Ch., B.A.O. (Belfast).

Area No. 3. (Population 375,658).

(Ramsbottom, Littleborough, Radcliffe, Heywood, Crompton, Royton, Prestwich, Middleton, Chadderton, Failsworth, Ashton-under-Lyne, Mossley, and Denton districts).

Consultant Tuberculosis Officer—George Fletcher, M.A., M.D., (Glas.), M.R.C.P. (Lond.), D.P.H. (Camb.)

Assistant Tuberculosis Officers—Cecil Berry, L.R.C.P., L.R.C.S. (Edin.), L.F.P.S. (Glas.), D.P.H. (R.C.S.I.), and John Cathcart, M.B., Ch.B. (Edin.), D.P.H. (R.C.P.S.I.).

Area No. 4. (Population 344,774).

(Westhoughton, Atherton, Farnworth, Leigh, Swinton and Pendlebury, Eccles, and Stretford districts).

Consultant Tuberculosis Officer and Visiting Medical Superintendent, Peel Hall Pulmonary Hospital—George Jessel, M.A., M.D. (Oxon.), D.P.H. (Manch.).

Assistant Tuberculosis Officers—Alexander B. Jamieson, M.B., Ch.B. (Edin.), and Henry J. Villiers, L.R.C.P.I., L.R.C.S.I.

Area No. 5. (Population 374,567).

(West Lancashire Rural, Great Crosby, Waterloo-with-Seaforth, Ince-in-Makerfield Hindley, Ashton-in-Makerfield, Newton-in-Makerfield, Whiston Rural, Warrington Rural, and Widnes districts).

Consultant Tuberculosis Officer and Visiting Medical Superintendent, Rufford Pulmonary Hospital—Charles W. Laird, B.A., M.D. (Dublin), D.P.H. (Liverpool).

Assistant Tuberculosis Officers—Charles H. Lilley, M.B., Ch.B. (St. Andrews), D.P.H. (Lond.), and G. Barker Charnock, L.R.C.S., L.R.C.P. (Edin.), L.R.F.P.S. (Glas.), D.P.H. (Liverpool).

Furness Sub-Area. (Population 38,657).

(Dalton-in-Furness, Grange-over-Sands, Ulverston, and Ulverston Rural districts).

Consultant Tuberculosis Officer—E. H. Allon Pask, M.D. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), Medical Superintendent of the High Carley Sanatorium.

Fylde Sub-Area. (Population 61,934).

(Fleetwood, Thornton Cleveleys, Fylde Rural, Garstang Rural (part), and Kirkham districts).

Consultant Tuberculosis Officer—George Leggat, M.B., Ch.B., D.P.H. (Aberdeen), Medical Superintendent of the Elswick Sanatorium.

SANATORIA AND HOSPITALS.

(owned or leased by the County Council).

High Carley Sanatorium and Oubas House Children's Sanatorium.

E. H. Allon Pask, M.D. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), Medical Superintendent (also Consultant Tuberculosis Officer for Furness Sub-Area).

James L. Armour, M.B., Ch.B. (Liverpool), M.R.C.S. (Eng.), L.R.C.P. (Lond.), Assistant Medical Superintendent.

Elswick Sanatorium.

George Leggat, M.B., Ch.B., D.P.H. (Aberdeen), Medical Superintendent (also Consultant Tuberculosis Officer for Fylde Sub-Area).

Chadderton Pulmonary Hospital.

James Wood, M.D., Ch.B., D.P.H., R.C.P.S.I., Visiting Medical Superintendent (also Medical Officer of Health for the Chadderton Urban District).

Heath Charnock Pulmonary Hospital.

John W. Rigby, M.R.C.S., (Eng.), L.R.C.P. (Lond.), Visiting Medical Superintendent (also Medical Officer to the Chorley Joint Hospital Board).

Peel Hall Pulmonary Hospital.
Rufford Pulmonary Hospital.
Withnell Pulmonary Hospital.

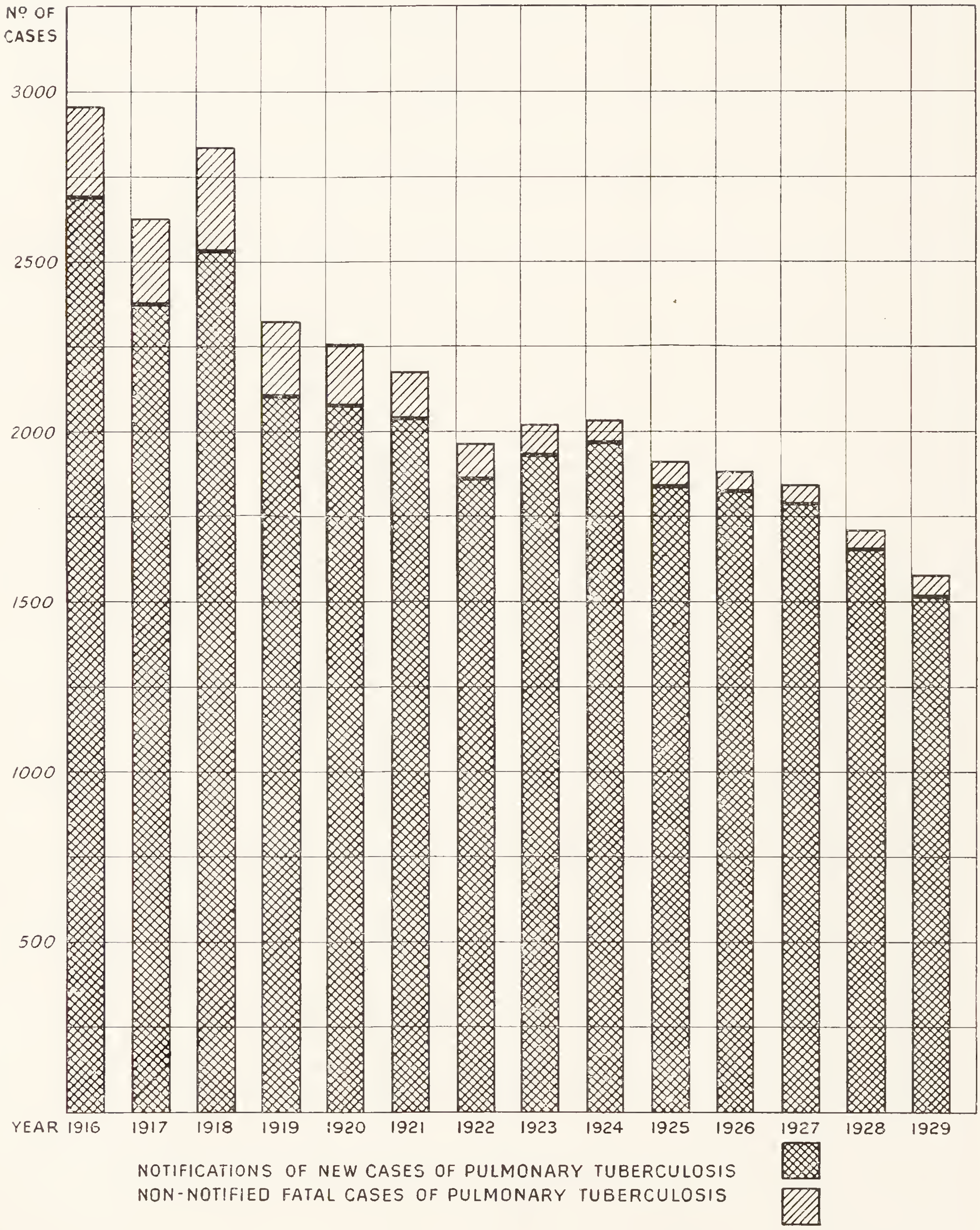
The Consultant Tuberculosis Officers of Dispensary Areas Nos. 4, 5, and 2 respectively, are the Medical Superintendents of these Hospitals.

TUBERCULOSIS HEALTH VISITORS.

Dispensary Area.	Name of Nurse.	Commenced Duties.
No. 1	L. Walker* ...	6th September, 1915.
	J. Skelcher ...	26th April, 1916.
	F. D. Abbott* ...	1st July, 1919.
	G. M. Hunter ...	4th June, 1928.
No. 2	R. Lambert* ...	12th June, 1914.
	A. Munro*	5th July, 1915.
	M. Duggan* ...	30th August, 1915.
	L. F. Norwood ...	5th January, 1920.
	E. Watterson ...	19th July, 1920.
	H. M. Alcock* ...	20th February, 1925.
No. 3	M. A. Potter ...	1st June, 1914.
	H. Dewsnap* ...	7th December, 1914.
	I. F. Macdonald* ...	2nd October, 1918.
	C. Guilfoy* ...	1st July, 1919.
	A. Flynn*	1st December, 1919.
	W. Swift	4th April, 1927.
	M. Sherwen ...	3rd January, 1928.
No. 4	M. B. Jones ...	1st December, 1919.
	H. M. Shakespeare*	1st March, 1921.
	F. G. Smith ...	1st November, 1921.
	A. Dickinson ...	5th September, 1923.
	A. Worsley* ...	23rd March, 1927.
	I. M. Corfield ...	1st April, 1930.
	K. Blakemore ...	1st July, 1930.
No. 5	E. Walch	15th June, 1914.
	I. Laing*	20th May, 1918.
	E. Walters* ...	1st October, 1918.
	M. J. Wilson* ...	1st July, 1919.
	A. Duncan	1st April, 1924.
	L. Farquhar* ...	2nd July, 1928.
	M. J. Evans ...	1st November, 1929.
Furness Sub-Area	A. E. Duston ...	1st February, 1921.
Fylde Sub-Area ...	A. Tweedy* ...	17th January, 1917.

* Possesses a health visitor's or sanitary certificate.

Number of new cases of Pulmonary Tuberculosis, 1916 to 1929 (including cases notified for the first time at death).



(See page 53.)

REPORT

OF THE

CENTRAL TUBERCULOSIS OFFICER

FOR THE YEAR 1929.

To the Chairman and Members of the
Lancashire County Council.

Ladies and Gentlemen,

I have the honour to submit the sixteenth annual report on the work of the tuberculosis department, and in this introductory portion will give briefly some of the principal features of the work in 1929.

Tuberculosis incidence and mortality.

The number of new cases of tuberculosis notified during the year has further declined, and is the lowest recorded since compulsory notification was instituted in 1912.

With regard to mortality, the death-rate from pulmonary tuberculosis (consumption) declined consistently year by year from 1923 to 1928; for 1929, however, there was a small increase (0·02) in the rate which coincided with a large increase in the deaths from other respiratory diseases (influenza, bronchitis, and pneumonia) occasioned by the severe weather early in that year. The returns of deaths from tuberculosis for the first few months in 1930 show such a fall that a record low death-rate for the current year is almost certain.

The deaths from non-pulmonary tuberculosis, namely 279, were the lowest on record; the decline, however, was not sufficient to affect the death-rate which remains at 0·15 per 1,000. The most remarkable decline in the deaths from non-pulmonary tuberculosis has taken place among the children aged 0 to 5; in 1914 there were 286 deaths, whereas in 1929 the number had declined to 76.

The County death-rate is still less than that for England and Wales, as it has always been. It may be of interest to give the death-rate per 1,000 of the population from all forms of tuberculosis in other administrative counties with a population in the region of a million or more:—Durham, 1·06; Essex, 0·76; Kent, 0·82; Middlesex, 0·83; West Riding of Yorkshire, 0·87. The Lancashire rate is 0·76, and England and Wales 0·95.

Recent advances in the diagnosis and treatment of pulmonary tuberculosis.

In the last few years surgical methods of treatment have been applied with ever-increasing momentum to more and more cases of pulmonary tuberculosis. This is a remarkable new orientation in regard to this disease.

The most used of the new surgical methods is what is called artificial pneumothorax—that is, a collapse of the lung by the injection of air through a needle with the result that the infected lung is put to rest on the same principle as an injured finger is put to rest by splint and bandage. Artificial pneumothorax is now commenced for suitable cases at all the County sanatoria and hospitals where there is an X-ray apparatus, and refills are done at the chief dispensaries when necessary. This year the medical superintendents of High Carley and Peel Hall have contributed notes on this treatment given by them, together with illustrative X-ray photographs (see pages 25 to 35).

A good example of a combination of surgery and medicine is provided by Sanocrysin, a gold salt, which is injected by needle and syringe into a vein in the arm. This form of treatment has been undertaken at the Peel Hall Pulmonary Hospital and at the High Carley Sanatorium, and reports on its trial on a number of patients are given on pages 9 to 17.

The modern treatment of pulmonary cases does not now stop at minor surgery. There are the operations of phrenic evulsion (removal of a piece of the phrenic nerve to put out of action one side of the diaphragm), and thorocoplasty (removal of portions of ribs over the affected lung so as to enable it to be collapsed). I hope in next year's report to be able to describe arrangements whereby suitable patients can have the benefit of such treatment. These recent developments make a correspondingly greater demand on the nursing staff and require a higher standard of skill than in the pre-war years when rest, fresh-air, good food and graded work were the chief methods adopted at all sanatoria and hospitals.

Artificial light treatment.

Twelve of the tuberculosis dispensaries have been equipped for giving artificial light treatment, and facilities for this form of treatment are within convenient access of all tuberculous persons requiring it. The results of light treatment in 1929 have continued to confirm the benefit of this treatment for certain forms of non-pulmonary tuberculosis, especially in two groups of cases—(*a*) lupus, and (*b*) adenitis with abscess formation and skin involvement. By giving treatment at the dispensary light centres instead of sending patients to hospital, considerable saving (£2,548 in 1929) has resulted to the

County Council; and, further, it has been possible for three-fourths of the patients to continue their normal occupation during the course of treatment. The results of light treatment are given on pages 36 to 40 where several photographs of cases treated are reproduced.

Respiratory diseases among cardroom workers in cotton mills.

A Special Committee was some months ago appointed by the Home Office to investigate the effects of dust in cardrooms of cotton mills upon the respiratory organs of the operatives. The Special Committee intimated that they would be pleased to avail themselves of a contribution by one of the County Tuberculosis Officers to the investigation of this special dust problem, and with the concurrence of the County Tuberculosis Committee, arrangements were made by the Home Office for 100 cardroom workers to have a thorough clinical, X-ray and bacteriological examination, at the Ashton-under-Lyne Chief Dispensary, by G. Fletcher, M.D., M.R.C.P., the consultant tuberculosis officer.

Dr. Fletcher has completed his investigation, and he gave evidence before the Special Committee of the Home Office on the 25th September, 1930. The results will be published in the annual report for 1930.

The dispensary organisation of the Lancashire tuberculosis scheme.

This year an attempt has been made on pages 57 to 59 to describe more fully the dispensary organisation with the aim of the County Council to provide in each dispensary area a hospital which is staffed by the staff of the area. In this way the dispensary side of tuberculosis work is not divorced from the institutional side.

Co-operation with medical practitioners, sanitary authorities, and health officials.

The results of the tuberculosis scheme would be very different if the relations with the medical practitioners in the County, together with the 119 sanitary authorities and their medical officers and sanitary inspectors, had not been of the most cordial and satisfactory character. I take this opportunity of acknowledging such co-operation from these sources. It was very satisfactory that 86 per cent. of new cases were sent *before notification* to the tuberculosis officers for an opinion as to diagnosis.

National Association for the Prevention of Tuberculosis.

At the request of the National Association for the Prevention of Tuberculosis, Dr. F. C. S. Bradbury, one of the assistant tuberculosis officers, has been given permission to help in an investigation which is being organised by this Association into the high incidence of tuberculosis on Tyneside. The investigation is expected to take about 12 months.

Visits to County sanatoria and hospitals.

During 1930 the County Tuberculosis Committee invited members of the several Hundreds of the County to the following institutions :—

Peel Hall Pulmonary Hospital.—Members of the Salford Hundred of the County Council and the County Tuberculosis Committee, visited on 22nd May, 1930.

Withnell Pulmonary Hospital.—Members of the Blackburn and Leyland Hundreds of the County Council and the County Tuberculosis Committee, visited on 18th June, 1930.

Rufford Pulmonary Hospital.—Members of the West Derby and Amounderness Hundreds of the County Council and the County Tuberculosis Committee visited on 18th September, 1930.

High Carley Sanatorium.—Members of the Lonsdale Hundred of the County Council and the County Tuberculosis Committee, visited on 30th September, 1930.

Visit of Sir George Newman.

On the 3rd March, 1930, we were honoured by a visit to Withnell Pulmonary Hospital of Sir George Newman, Chief Medical Officer of the Ministry of Health, who made an inspection of the institution.

Cost of the County scheme.

The cost of the tuberculosis scheme of the County Council for 1929–30 has, after allowing for Government grants, required a County Rate of 1·73 pence (or 1¾d.) in the £.

I have again to thank my medical colleagues and the nursing and clerical staffs for continued help. I have had very valuable help from my principal clerk, Mr. H. F. Hughes, especially in preparing this report, and have, in addition, to thank the Public Health Department for furnishing certain statistics on notifications and deaths.

I am,
Your obedient Servant,
G. LISSANT COX,
Central Tuberculosis Officer.

County Offices, Preston.
11*th October*, 1930.

I.—TUBERCULOSIS INCIDENCE AND MORTALITY IN 1929.

NEW CASES NOTIFIED.

There were 1,517 new cases of *pulmonary* tuberculosis notified under the Statutory Regulations in the Administrative County in 1929. This number is again the lowest on record. Since 1924, when the new cases numbered 1,972, there has been a steady fall each year (see table, page 3).

The new notifications of *non-pulmonary* (surgical) tuberculosis—913 in number—are also down, being 43 less than the previous year and 107 below the average for the preceding five years.

If we compare the Lancashire figures with those of England and Wales, the notifications of all forms of tuberculosis in the Administrative County in 1929 represent 1,340 per million of the population against 1,743 for the rest of England and Wales. The gradual and fairly uniform diminution in the number of new cases of tuberculosis notified in the County has taken place in spite of the depression in the cotton, coal, and allied industries. It would appear that the social services of recent years, coupled with the direct attack on the disease have, up to the present, more than counterbalanced the adverse factor of unemployment.

DEATHS FROM TUBERCULOSIS

Pulmonary Tuberculosis.

The death-rate per 1,000 of the population for pulmonary tuberculosis, namely, 0·60, shows a small increase of 0·02 over 1928, but it is, with the exception of that year, the lowest ever recorded.

In crude figures the pulmonary deaths were 1,102 against 1,066 in 1928. The increase of 36 deaths accompanies a large increase in the deaths from various respiratory diseases, *viz.* :—

Influenza : 1928, 564 deaths ; 1929, 1,690 deaths ; increase, 1,126.
Bronchitis : 1928, 1,346 deaths ; 1929, 1,962 deaths ; increase, 616.
Pneumonia : 1928, 1,486 deaths ; 1929, 2,168 deaths ; increase, 682.

This greater mortality from respiratory diseases coincided with the severe cold experienced early in 1929, and the slight set-back in the tuberculosis death-rate is, in my opinion, only temporary. The figures for the first few months in 1930 show such a fall that a further record low death-rate for the current year is almost certain.

The mortality from pulmonary tuberculosis does not by any means fall evenly upon the sexes, for the male mortality is now invariably heavier, the experience of 1929 accentuating this difference as will be seen from the last column in the following Table 1 :—

Table 1.

Average for three years, or year.	Estimated sex population of Admin. County.	Pulmonary deaths in various age-groups.*								Death rate per 1,000 of sex popn.
		0 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and over	Total Deaths	
Males–										
1921–23...	836,754	23	123	136	160	153	89	29	713	0·85
1924–26...	848,134	23	114	126	142	146	76	22	649	0·76
1927 ...	855,117	15	101	114	138	125	70	25	588	0·68
1923 ...	860,199	9	117	116	112	110	73	38	575	0·66
1929 ...	**860,532**	**19**	**100**	**107**	**140**	**151**	**91**	**26**	**634**	**0·73**
Females–										
1921–23...	924,887	38	170	154	106	67	38	19	591	0·63
1924–26...	937,466	29	174	131	94	64	36	15	543	0·57
1927 ...	945,183	28	152	145	85	46	45	16	517	0·54
1928 ...	950,801	26	157	132	70	48	39	19	491	0·51
1929 ...	**951,168**	**10**	**150**	**135**	**85**	**44**	**27**	**17**	**468**	**0·49**

* These are the actual numbers of deaths; it has not been possible to calculate the death-rates in each age-group owing to the difficulty in estimating the population year by year in those groups.

The table shows a welcome return to the gradual reduction in the deaths among the young adults, aged 15 to 25, of both sexes. This is, perhaps, not entirely unconnected with the growing practice of artificial pneumothorax treatment. It is the male groups between the ages 35 and 65—peaking at the group 45 to 55—that have suffered the set-back. It has long been a peculiar feature that females contract and succumb to pulmonary tuberculosis at a much earlier age, namely 15 to 35 years, than do males, who, with the solitary exception of 1928, bear their higher mortality in the " middle age " group, 35 to 55.

Non-Pulmonary Tuberculosis.

The actual number of deaths from non-pulmonary tuberculosis was 279, which is the lowest on record; the reduction over 1928 is not, however, sufficient to vary the rate per 1,000 of the population from last year's record figure of 0.15. As with pulmonary tuberculosis, the males suffer a higher death-rate (0·18) from the non-pulmonary form of the disease than do the females (0·12). With both sexes the greatest mortality occurs in childhood.

The most striking decline in the deaths from non-pulmonary tuberculosis has taken place in the age-group 0 to 5 years; in 1914 the deaths in this group totalled 286, whereas in 1929 they were only 76. The cases notified have also declined, but at not quite the same rate.

Tuberculosis of the bones, joints, glands, peritoneum, and skin may be of the bovine type (*i.e.*, infection from tuberculous milk) or of the human type (infection from a human being). Recent researches undertaken in this County leave no doubt that an " open " pulmonary case may be the cause of non-pulmonary infection of a child. Consequently, the reduction in the pulmonary cases, the supervision exercised by the dispensary staff, and the isolation where necessary of cases in hospital are all factors helping to reduce the number of children with non-pulmonary disease. There are also the efforts of the local authorities charged by Parliament to eradicate tuberculous cows and otherwise to safeguard the milk supply.

CASES AND DEATHS.

Table 2 below shows the actual number of cases notified and the deaths registered during the seventeen years 1913 to 1929 in the Administrative County :—

Year.	Cases Notified.			Deaths.			Death-rate per 1,000 of population.		
	Pulmonary Tuberculosis	Non-Pulmonary Tuberculosis	Total.	Pulmonary Tuberculosis	Non-Pulmonary Tuberculosis	Total.	Pulmonary Tuberculosis	Non-Pulmonary Tuberculosis	Tuberculosis (all forms)
1913	2,700	1,592	4,292	1,441	527	1,968	0·82	0·30	1·12
1914	2,820	1,140	3,960	1,523	572	2,095	0·87	0·32	1·19
1915	2,872	1,128	4,000	1,614	555	2,169	0·96	0·34	1·30
1916	2,689	1,180	3,869	1,685	471	2,156	1·04	0·29	1·33
1917	2,375	1,062	3,437	1,584	466	2,050	1·00	0·30	1·30
1918	2,534	885	3,419	1,652	435	2,087	1·07	0·28	1·35
1919	2,105	847	2,952	1,339	358	1,697	0·80	0·22	1·02
1920	2,084	968	3,052	1,323	396	1,719	0·76	0·23	0·99
1921	2,044	899	2,943	1,301	376	1,677	0·73	0·21	0·95
1922	1,863	956	2,819	1,362	389	1,751	0·77	0·22	0·99
1923	1,937	1,188	3,125	1,250	412	1,662	0·70	0·23	0·93
1924	1,972	1,120	3,092	1,215	339	1,554	0·68	0·19	0·87
1925	1,846	1,027	2,873	1,205	361	1,566	0·67	0·20	0·87
1926	1,828	953	2,781	1,158	286	1,444	0·64	0·16	0·80
1927	1,794	1,045	2,839	1,105	296	1,401	0·61	0·16	0·77
1928	1,660	956	2,616	1,066	287	1,353	0·58	0·15	0·74
1929	**1,517**	**913**	**2,430**	**1,102**	**279**	**1,381**	**0·60**	**0·15**	**0·76**

In Appendix I. are given the deaths and death-rates from pulmonary and non-pulmonary tuberculosis in 119 urban and rural sanitary districts in the Administrative County, and in the several dispensary areas.

The notifications of tuberculosis in 1929 are dealt with further in Appendix II, where folding Tables B, C, and D, are inserted, analysing them as regards the parts of the body affected, age, and sex.

II.—RESEARCH WORK AND NEW METHODS OF TREATMENT.

Pulmonary Tuberculosis among Children in relation to Sanatorium Accommodation.

The establishment, with certainty, of a diagnosis of pulmonary tuberculosis among children under the age of 15 years presents much difficulty. Thus, a great deal must be left to the experience and shrewdness of the tuberculosis officer concerned.

Closely related to the number of children taken on the dispensary registers by the tuberculosis officers is the amount of sanatorium accommodation provided for the treatment of the children. In the Administrative County of Lancaster there is an average of one bed per 6,883 of the child population (ages 0 to 15) as compared with a corresponding ratio of one bed per 4,641 for the whole of the county authorities in England and Wales.

In the Administrative County of Lancaster, therefore, the proportion of sanatorium beds for children is less than the rest of the counties, and from available figures the proportion of children accepted by the Lancashire tuberculosis officers as suffering from pulmonary tuberculosis per 1,000 of the child population is also very low. It is conceivable that among the children referred as suspicious cases by practitioners and school medical officers, many cases of the disease may be missed. If this happened, then one would expect that a number of these rejected cases would return later in life with definite disease.

To ascertain whether any unusual proportion of the rejected cases did return, I had a special investigation made on the following lines :

The consecutive case sheets of 1,545 young adults (age-group 15 to 25) diagnosed by the tuberculosis officers as suffering from tuberculosis (all forms), during the years 1927, 1928 and 1929 were listed. A special enquiry was made by the dispensary staff whether at any time during childhood any of these young adults had been examined by a tuberculosis officer in Lancashire or other area and rejected as being non-tuberculous. The non-pulmonary cases were included in the investigation as they might have been referred in childhood for a chest examination.

The results of the investigation are contained in the following table :—

TABLE 3.—*Young adults coming on dispensary registers as definite cases of tuberculosis during the three years* 1927–8–9.

Classification.	Sex	Age at which tuberculosis diagnosed. (two-year groups).						Remarks.
		15–16 years.	17–18 years.	19–20 years.	21–22 years.	23–24 years.	Total M & F	
(*a*) Pulmonary tuberculosis (minus)	M.	25	40	33	24	26	148	305
	F.	26	25	41	40	25	157	
Number seen by t.o. in childhood and diagnosed as non-tuberculous	M.	—	—	—	—	—	—	
	F.	—	—	—	1	—	1	Seen at age 12.
(*b*) Pulmonary tuberculosis (positive)	M.	21	65	70	99	59	314	779 ; total pul. 1,084.
	F.	57	100	112	98	98	465	
Number seen by t.o. in childhood and diagnosed as non-tuberculous	M.	1	—	2	—	—	3	Seen at ages 13, 14 & 12.
	F.	2	1	—	—	—	3	Seen at ages 7, 10 & 11.
(*c*) Non-pulmonary tuberculosis	M.	44	45	40	44	31	204	Total non-pul. 461.
	F.	56	50	55	50	46	257	
Number seen by t.o. in childhood and diagnosed as non-tuberculous	M.	3	—	—	—	—	3	Seen at ages 9, 10 & 13.
	F.	1	—	—	1	—	2	Seen at ages 10 & 11.

Thus, of 1,084 new pulmonary patients, aged 15 to 25, coming on the dispensary registers during the past three years, only 7, or 0·64 per cent., were cases which had been seen in childhood and diagnosed by the tuberculosis officers as non-tuberculous. The corresponding figure for the 461 non-pulmonary cases was 5, or 1·08 per cent.

From 1914 (when the Lancashire dispensary scheme began) to 1928, the tuberculosis officers examined some 17,000 children (excluding contacts) ; 7,000—actually 7,002—(41 per cent.), were accepted as tuberculous (pulmonary, 4,737 ; non-pulmonary, 2,265) ; and 10,000 (59 per cent.) rejected. Of the 10,000 children, a deduction of approximately 3,000 should be made for removals from the County area and for deaths from various causes. If any of the remaining 7,000 persons contracted tuberculosis, the great majority of them would have returned to the dispensary during the three years 1927–29. It must not be overlooked that all the children referred to the tuberculosis officers had been suspected by medical men, and on that account the children as a whole would be sub-normal ; some of them were bound to be subjected, in the ordinary hazard of life, to the risk of infection from existing cases of tuberculosis (particularly the unknown, un-notified, and therefore un-supervised, infective case).

The result of the investigation appears to be a justification of the conservative policy of the Lancashire tuberculosis officers in the diagnosis of pulmonary tuberculosis in children.

In Essex, Dr. W. Burton Wood, consultant in pulmonary tuberculosis to the County Council, has contributed an interesting report* on "Pulmonary Tuberculosis with special reference to its Diagnosis in Children of School Age," from which the following extracts are taken, as they have a bearing on the Lancashire investigation :—

> "Consumption among school children is extremely rare. In "the whole County of Essex at any given time there are only "about a dozen cases.
>
> "The children of the dispensaries and sanatoria are not "the children who develop consumption in adolescence. A "history of 'pre-tuberculous' childhood is practically unknown "among adolescent consumptives. It is highly improbable that "attendances at a dispensary or a few weeks residence at Sible "Hedingham [Sanatorium] confer life-long immunity. . . . We "have no right to attach the stigma of pulmonary tuberculosis "to any child in the absence of definite proof and in the presence "of any other cause for ill-health. . . . Consumptives usually "give a history of a healthy childhood."

Conclusions.

The conclusions which emerge from the investigation may be summarised as follows :—

(*a*) The rejection of 59 per cent. of the children, aged 0 to 15 years, referred as suspicious cases, possibly tuberculous, appears to have been fully justified ;

(*b*) The children rejected by the tuberculosis officers as being non-tuberculous did not in the young adult age (namely, 15 to 25 years) return to the dispensary as definite cases of pulmonary tuberculosis. The investigation shows that of 1,084 young adults coming on the dispensary registers as new pulmonary cases, only 0·64 per cent. had been previously rejected in childhood by the tuberculosis officers ; and

(*c*) The very conservative diagnosis of pulmonary tuberculosis in children has made few sanatorium beds necessary, with the consequent saving of public money.

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* Administrative County of Essex, report of M.O.H. for 1928, p. 84.

THE FATE OF YOUNG CHILDREN IN TUBERCULOUS HOUSEHOLDS.

In the last report there appeared an epitome of certain research work undertaken by the Lancashire group of tuberculosis officers at the suggestion of the Joint Tuberculosis Council. Among the conclusions were the following :—

> The death-rate from all causes in the first year of life among 1,023 children born into a household where there was a sputum positive case of pulmonary tuberculosis was significantly less than the control rate ;
>
> The death-rate from all causes in the first year of life among 428 children born into a household where there was a sputum negative case was a little over half the control rate.

These conclusions when published were regarded as remarkable, as it was not generally accepted that during the first year of life children in tuberculous households have a lower death-rate from all causes than the normal. Therefore it is important to record that confirmation of the Lancashire results has since been reported by Dr. N. Tattersall, the chief clinical tuberculosis officer for Leeds, who has undertaken a similar and independent research. In the annual report for 1928 of the medical officer of health of Leeds the following statement appears :—

> " A preliminary analysis of the mortality of the babies born [in Leeds] in 1925, 1926 and 1927 has recently been carried out. Out of the 608 babies entered on the cards in these three years, all but five were traced at the end of the first year of life. Of these, 488 were contacts of sputum negative cases and 115 contacts of sputum positive cases.
>
> " Grouping them all together their state at the end of the first year was as follows :—

Dead (tuberculosis 5, other causes 37)	42
Ill with tuberculosis	5
Delicate	103
Alive and well	453
	603

> " This represents an infantile mortality per thousand births of 70, whereas for the whole of Leeds over the same period the figure was 88.
>
> " When analysed separately the group of infants who were contacts to sputum positive cases show a death-rate of 95·6 per

thousand births, and for those in contact with sputum negative cases the rate was 63·5.

> " The number of children observed in the succeeding years of life is as yet hardly large enough to draw any definite conclusions, but the figures so far available indicate that the low mortality in the first year of life as compared with the general population is not maintained, and that the mortality, especially from tuberculosis, in the succeeding years is significantly higher than that among the ' control ' population. It appears surprising that the death-rate in the first year of life in the total group is considerably lower than that of the ' control ' population, and that even in the group in contact with sputum positive cases the death-rate is not significantly higher. These findings, however, are generally in accord with the results obtained in a similar investigation recently carried out in Lancashire.
>
> " Dr. Lissant Cox who organised the Lancashire inquiry suggests that the fact of the supervision of the tuberculous household by medical and nursing staffs may explain what is otherwise a remarkable finding.
>
> " It will be several years before the present investigation in Leeds] can be completed and the above details are only submitted as a rough indication of the trend of the inquiry."

Since the publication of the results of the Lancashire research, an investigation has been made by the Research Department of the Brompton Hospital for Consumption and Diseases of the Chest on " Tuberculosis Mortality in Children " and they make the following finding :—

> " . . . that the percentage death-rate within the first five years of life for children who have lived from birth in contact with a parent with positive sputum is 2·6 per cent."

Here again it is interesting to note that the corresponding figure in the Lancashire research was 2·7 per cent.

SANOCRYSIN TREATMENT OF PULMONARY TUBERCULOSIS.

Sanocrysin is a white crystalline compound—a double thiosulphate of gold and sodium—easily soluble in water. It was first introduced, in 1923, by Moëllgaard (of Denmark) for the treatment of tuberculosis. As promising results had been reported by him and others, it was decided to make a trial of it at the Peel Hall Hospital and at the High Carley Sanatorium.

Sanocrysin Treatment at Peel Hall Pulmonary Hospital.

Dr. G. Jessel, the visiting medical superintendent of the Peel Hall Pulmonary Hospital and consultant tuberculosis officer for Dispensary Area No. 4, has contributed the following report on the trial of Sanocrysin at Peel Hall.

It must be remembered that the patients at the hospital are for the most part chronic cases with extensive disease or acute febrile cases. In both types, ordinary sanatorium measures, *e.g.*, strictly controlled rest with fresh air and good feeding, and subsequently a carefully supervised regime of occupation-therapy, are frequently able to bring about the desired improvement. This fact must be borne in mind in attempting to appraise any new form of treatment.

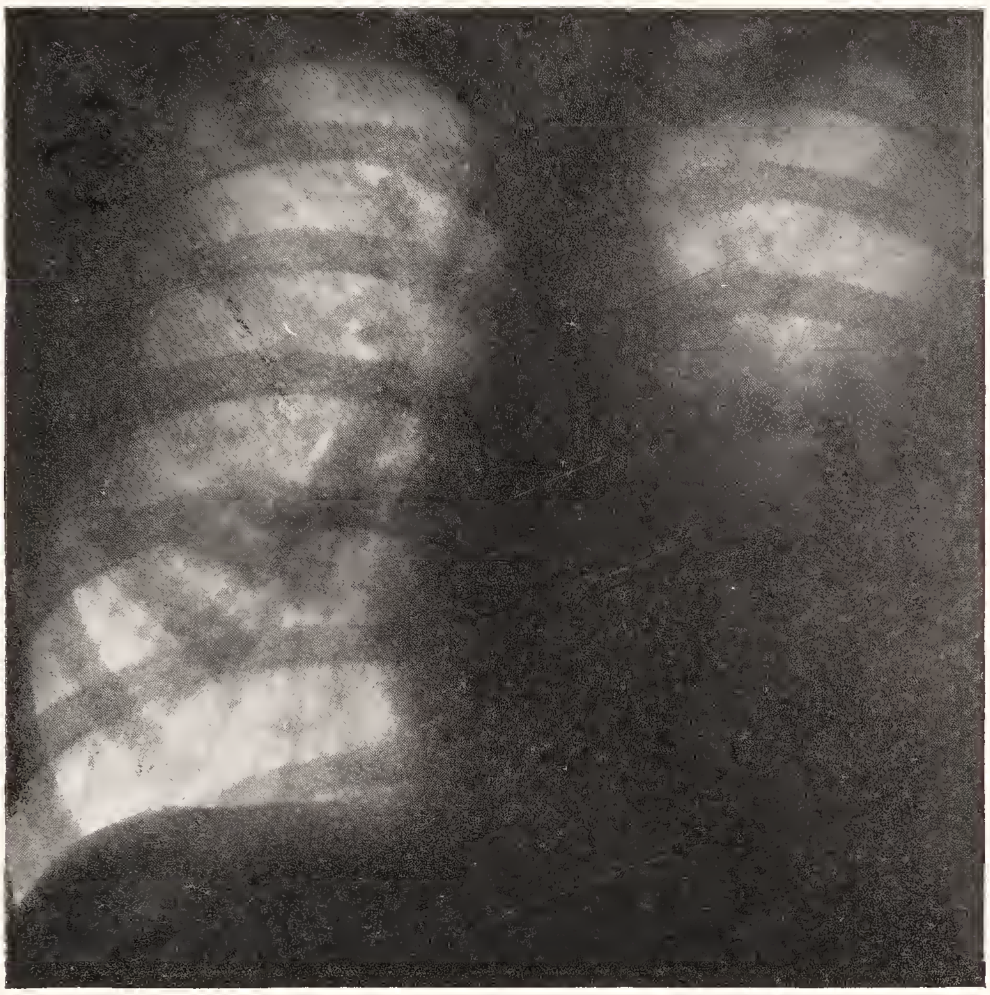
There is, moreover, a definite type of ease suitable for artificial pneumothorax treatment (which is the subject of a special report on page 29), and usually Sanocrysin has not been given in such cases. In two patients (Nos. 1111 and 1153), however, it was tried owing to extending disease in the contralateral lung. Apart from these cases, the drug has only been used in cases not responding, or unlikely to respond, to ordinary measures and with too much disease in both lungs for artificial pneumothorax to be considered. It is thus clear that the test was a severe one. In a few very advanced cases the treatment was begun and abandoned after two or three doses, because it was obviously doing no good, and the conclusion was soon reached that no good purpose could be served by exhibiting the drug in such cases.

The report deals with 25 patients who completed a full course of treatment, one of them (1096) having a second course. They were all males of average age 28 years (*i.e.*, in the main, young adults) who had extensive bilateral disease and were regarded as unlikely to do well under ordinary treatment. Nineteen patients received their course during 1929 and the remainder in 1930. The condition of the patients is given in Table 4 as it appeared shortly after the completion of the course, which usually lasted eight or nine weeks. In the table also is added, in regard to the cases treated in 1929, their condition more than six months after the completion of the course.

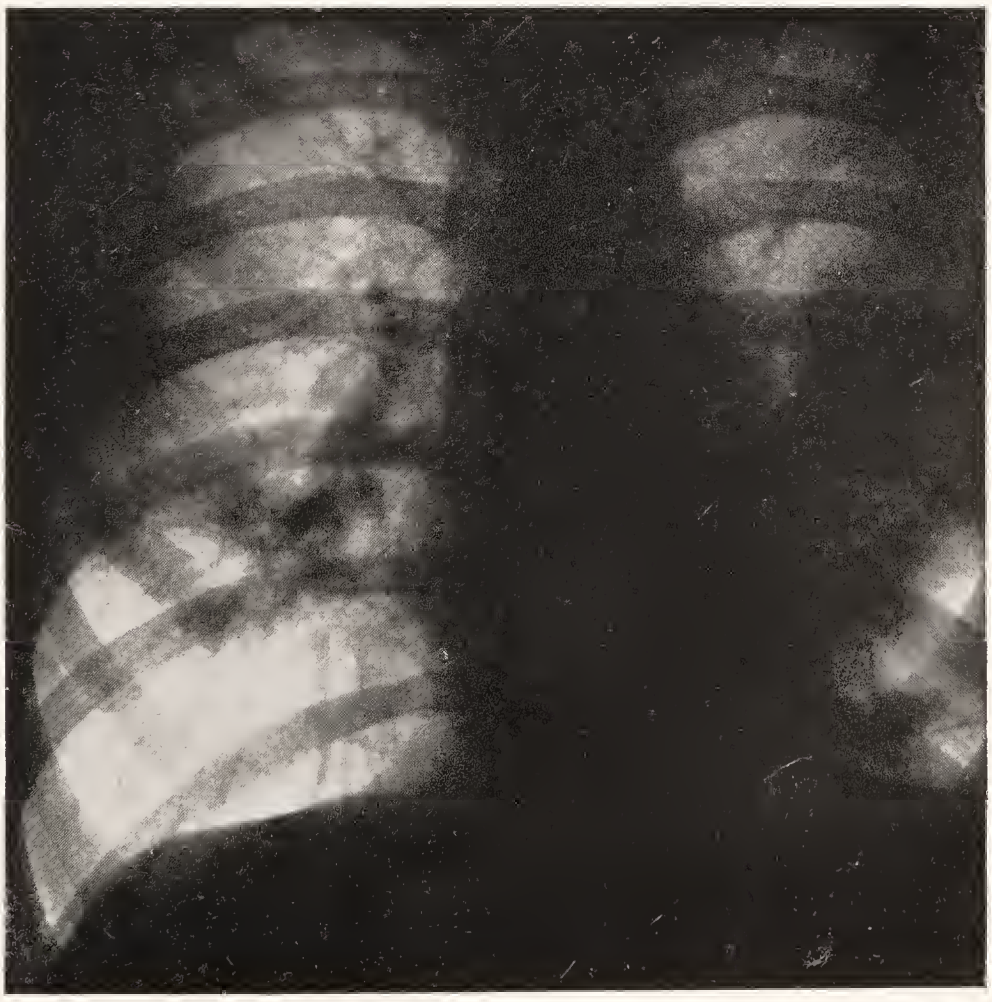
In selecting cases, those with intestinal symptoms or albuminuria were excluded, and careful attention was paid to the condition of the mouth. The doses were given at weekly intervals by means of intravenous injection into a convenient vein on the flexor aspect of the elbow. It was found that by the use of normal saline at body temperature, in place of ordinary boiled water, toxic symptoms were rare, though occasionally vomiting, diarrhœa, transient rashes, stomatitis and high fever occurred. All these were, however, of short duration. The doses were given at weekly intervals usually as follows :—0·10, 0·20, 0·35, 0·50, 0·60, 0·75, and 1·00 grm., the last dose being repeated after ten days' interval.

Turning to the effects of treatment, the response was dramatic in two or three cases, especially as regards No. 1096, whose initial temperature chart showing high fever is here reproduced. Subsequently he had a relapse, but a second course again was remarkably successful and he is now very well and active. Three patients (1153, 1088, and 1137) lost the tubercle bacilli from the sputum, gaining 10, 14, and 15 lbs. weight respectively. In one (1153), the bacilli reappeared in the sputum but the patient is keeping well, while in three others (1096, 1110, and 1152) the bacilli subsequently disappeared, that is, in five cases the sputum had become negative after a minimum interval of six months from the conclusion of treatment. One patient (1066) gained 13½ lbs. and was very well, but his sputum remained positive.

Skiagrams of patients Nos. 1096 and 1123, showing clearing after treatment, are reproduced. (See skiagrams S1 (*a*), 1 (*b*), S2 (*a*) and 2 (*b*)). Clearing of skiagrams has not, however, been the rule even in patients who were doing very well. In most cases Sanocrysin appeared to lead to inflammatory changes resulting ultimately in fibrosis, and accordingly mottled appearance of even greater intensity may be seen, differing in character according to the degree of fibrosis reached. In any event, it would be unreasonable to expect the disappearance of extensive disease in a few weeks ; the most that could be expected would be the establishment of a tendency whereby the defensive forces of the body begin to gain the upper hand. It is not unlikely that Sanocrysin acts, not by virtue of any specific property, but because it exercises a pronounced stimulating effect to which certain patients are capable of responding. After all, the real test of any treatment is whether a patient, who was acutely ill and feverish with extensive disease, begins to show signs of definite improvement which continues ; in other words, the condition of the patient is the most reliable test.

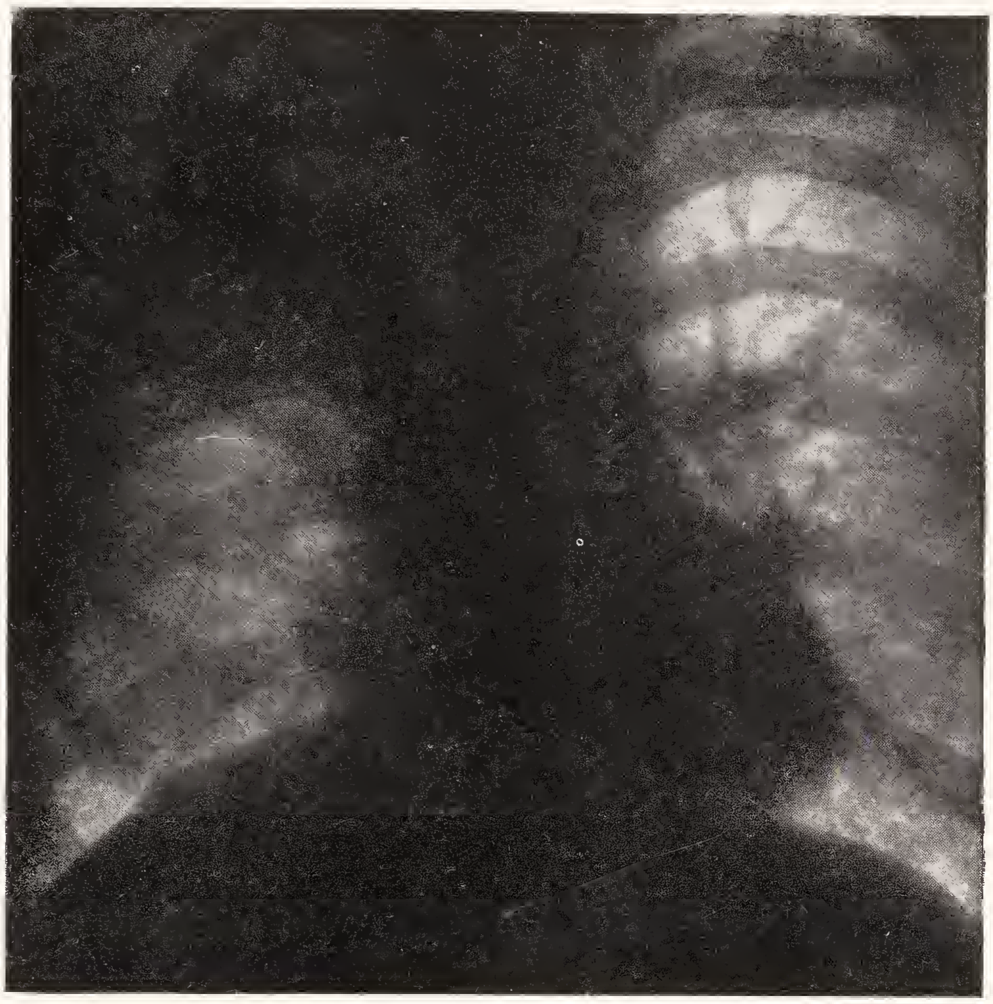


S.1(*a*).—Hosp. No. 1096. Patient aged 19, male, sputum positive. Skiagram taken 13/12/29 shows extensive disease on left side before Sanocrysin treatment commenced.

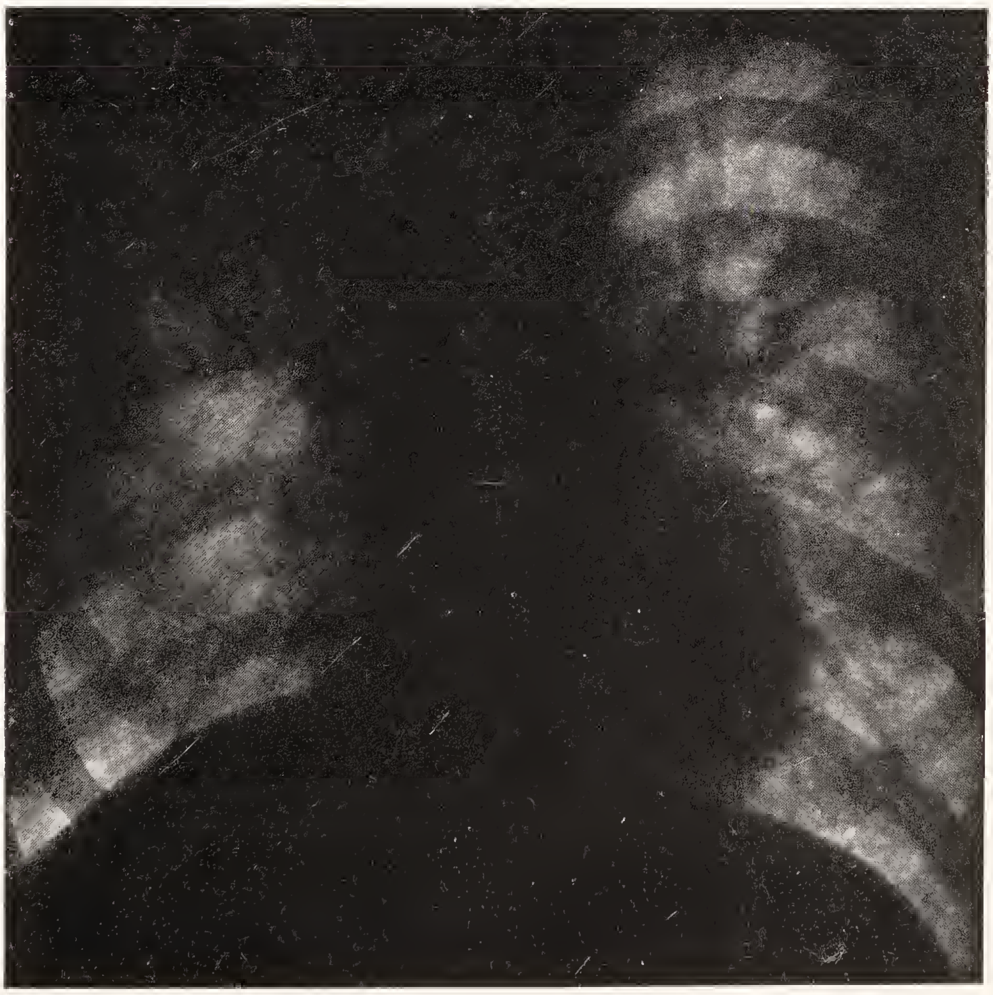


S.1(*b*).—Same patient. Skiagram taken 15/4/30 after course of Sanocrysin treatment shows clearing on left side.

[*Skiagrams taken at Peel Hall Pulmonary Hospital.*]



S.2(*a*).—Hosp. No. 1123. Patient aged 22, male, sputum positive. Skiagram taken 6/11/29 shows appearances before Sanocrysin treatment commenced.

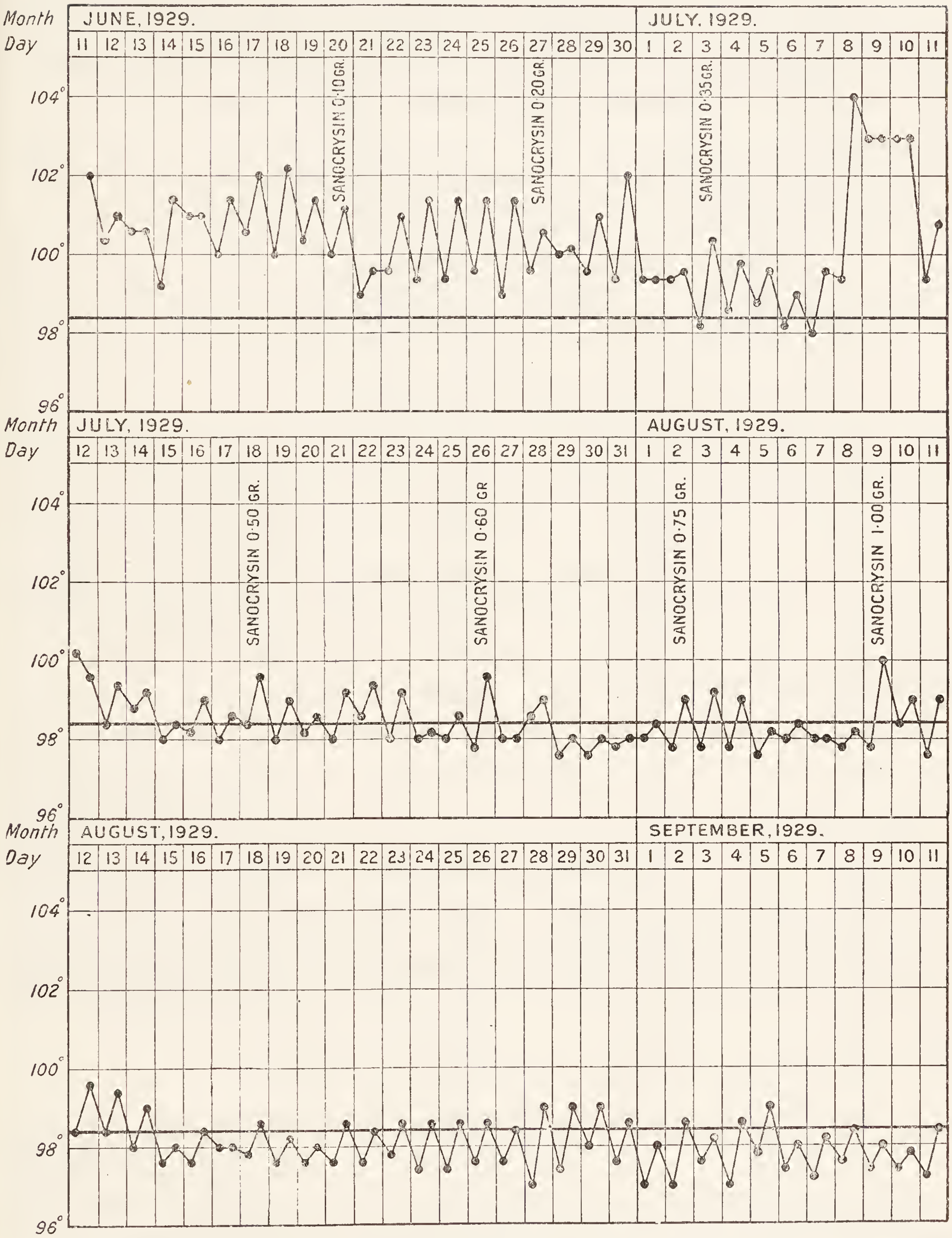


S.2(*b*).—Same patient. Skiagram taken 5/5/30 after course of Sanocrysin treatment shows partial clearing of mottling on right side.

[*Skiagrams taken at Peel Hall Pulmonary Hospital.*]

PEEL HALL.

Temperature Chart of patient given Sanocrysin Treatment.



Patient N.M. (Hosp. No. 1096), aged 19 years; mother died of tuberculosis; admitted to Peel Hall Pulmonary Hospital on 11th June, 1929.

Temperature on admission, 102°; physical signs: right upper - dulness and crepitations; X-ray: mottling both lungs to middle zone, especially left lung.

Sanocrysin administered: June 20th, 0·10 grm.; June 27th, 0·20 grm.; July 3rd, 0·35 grm.; July 18th, 0·50 grm.; July 26th, 0·60 grm.; August 2nd, 0·75 grm.; August 9th, 1·00 grm.; after Sanocrysin X-ray showed marked clearing left lung.

Condition, June, 1930: no active physical signs; afebrile; up all day; hobby exercise: gardening; secretary of patients' social club.

Table 4 shows that improvement occurred in 14 cases out of 25 (10 out of 19 in 1929, and 4 out of 6 in 1930) and that after a period of six months 10 of the 1929 cases still showed definite improvement, being up and about. It is significant that those patients not improved by the treatment were nearly all dead, and it is probable that the same fate would have overtaken the remainder if the Sanocrysin had not been given.

TABLE 4.—Condition of patients who completed a course of Sanocrysin treatment at Peel Hall in (*a*) 1929 and (*b*) 1930.

Hospital No.	Age.	Sputum.		Condition shortly after course completed.	Condition six months or more after course completed.	Remarks.
		Before injections.	After injections.			
				(a) 19 cases treated in 1929.		
997	32	+	+	Improved	Improved	Gained 2½ lbs. Up and about at home.
1066	39	+	+	Improved	Improved	Gained 13½ lbs. Up and about at home.
1045	27	+	+	Dead	Dead	Had temporary improvement but then died.
1088	19	+	—	Improved	Improved	Gained 14 lbs. Left County area—very well and fit for work (letter).
1089	17	+	+	Dead	Dead	Red-haired youth.
1083	18	+	+	Dead	Dead	
1053	44	+	+	Dead	Dead	
1096	19	+	+	Not improved	Improved	Subsequently had a second course. T.B. disappeared from sputum. Up all day, very well.
1137	25	+	—	Improved	Improved	Gained 15 lbs. Up and about at home.
1106	57	+	+	Improved	Not improved	Gained 7 lbs. at first. Now at home becoming worse.
1110	24	+	+	Improved	Improved	Gained 8½ lbs. Up all day. T.B. disappeared from sputum.
1132	21	+	+	Dead	Dead	
1092	32	+	+	Dead	Dead	
1153	21	+	—	Improved	Improved	Had artificial pneumothorax. Many adhesions. Up all day. Gained 10 lbs. T.B. reappeared in sputum.
1095	19	+	+	Not improved	Dead	Also T.B. Shoulder.
1152	25	+	+	Not improved	Improved	T.B. disappeared from sputum. Gardening.
1123	22	+	+	Improved	Improved	Gained 18 lbs. At home, up all day.
1158	24	+	+	Improved	Improved	Gained 4¾ lbs. Up all day. Painting.
1111	25	+	+	Improved	Not improved	Having bilateral pneumothorax. Afebrile.

TABLE 4.—(continued).

Hospital No.	Age.	Sputum.		Condition shortly after course completed.	Condition six months or more after course completed.	Remarks.
		Before injections.	After injections.			
				(b) 6 cases treated in 1930.		
1028	22	+	+	Not improved	—	Artificial pneumothorax. Temporary improvement, then extension of disease.
1209	40	+	+	Dead	—	
1194	41	+	+	Improved	—	Gained 2½ lbs. Up.
1173	26	+	+	Improved	—	Up.
1186	20	+	+	Improved	—	Up a little.
1221	46	+	+	Improved	—	Obviously better.

Summary and Conclusions.

1. Of 25 male patients, average age 28 years, with acute and extensive disease in both lungs, who completed a course of Sanocrysin treatment, 14 showed definite improvement and 11 were unaffected.

2. After a further period of six months there were still 10 of the 1929 group up and about and much improved.

3. Sanocrysin is not a specific for pulmonary tuberculosis, but is a useful drug for certain patients who are unsuitable for other forms of treatment.

Sanocrysin Treatment of Pulmonary Tuberculosis at High Carley Sanatorium.

Dr. E. H. Allon Pask, the medical superintendent of the High Carley Sanatorium, has furnished the following report on the trial, commencing in August, 1929, of Sanocrysin on 20 patients.

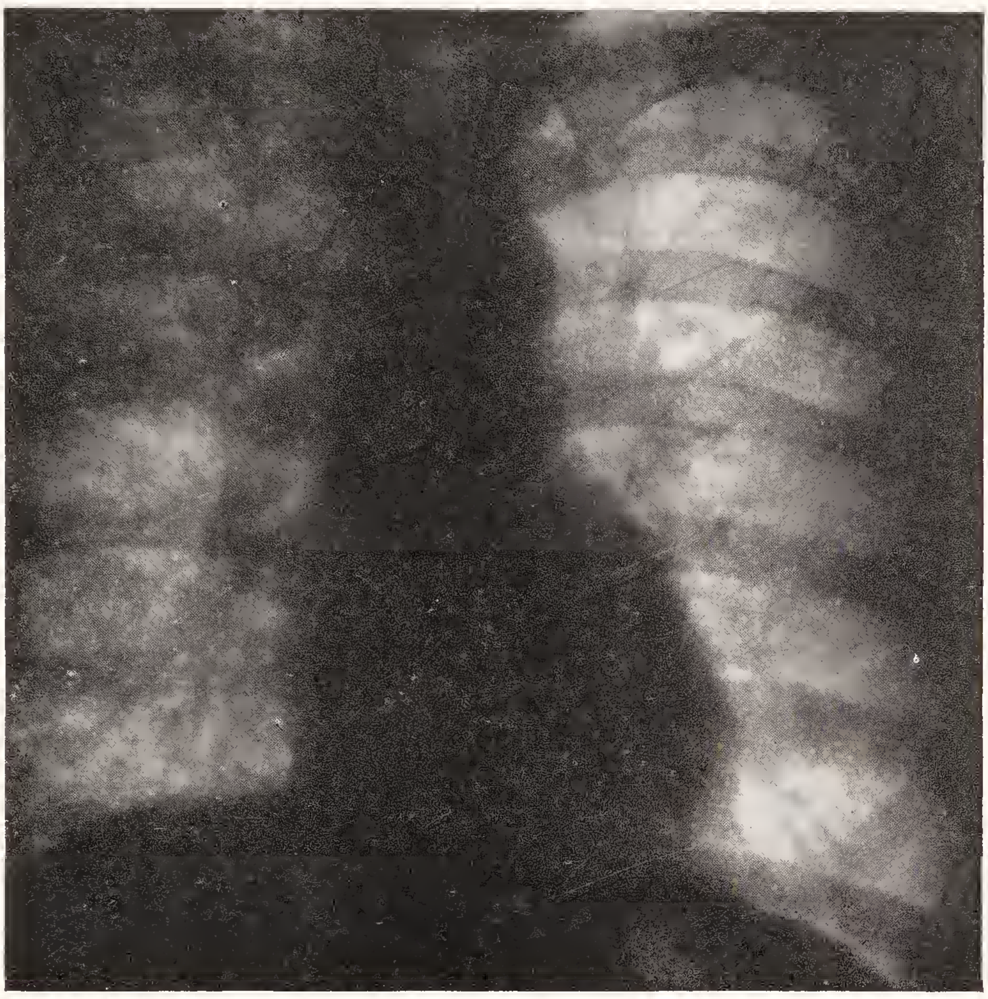
Sanocrysin is a drug to be used with extreme caution and the dosage must be carefully regulated. At the commencement of the trial numerous complications occurred, so much so, that the question of continuing the treatment was seriously considered. Complications were less common in the later cases although the system of dosage was the same. Patients remain in bed for 24 hours after each injection. If any complication occurs the drug is withheld until this has subsided and no increase of dosage is made, the last dose being repeated.

The drug is administered intravenously, and the dose is gradually increased from a minimum of 0·025 grm. to a maximum of 1·00 grm., the dosage being regulated by the body weight and general condition of the patient. The smaller doses are given at intervals of three or four days and the larger doses at intervals of a week or longer ; there is no hard and fast rule as to the intervals between the doses, these being regulated entirely by the reaction of the patient to the drug. The average duration for those who completed the course of Sanocrysin treatment was 15 weeks, the shortest time for the full course being six weeks and the longest 33 weeks.

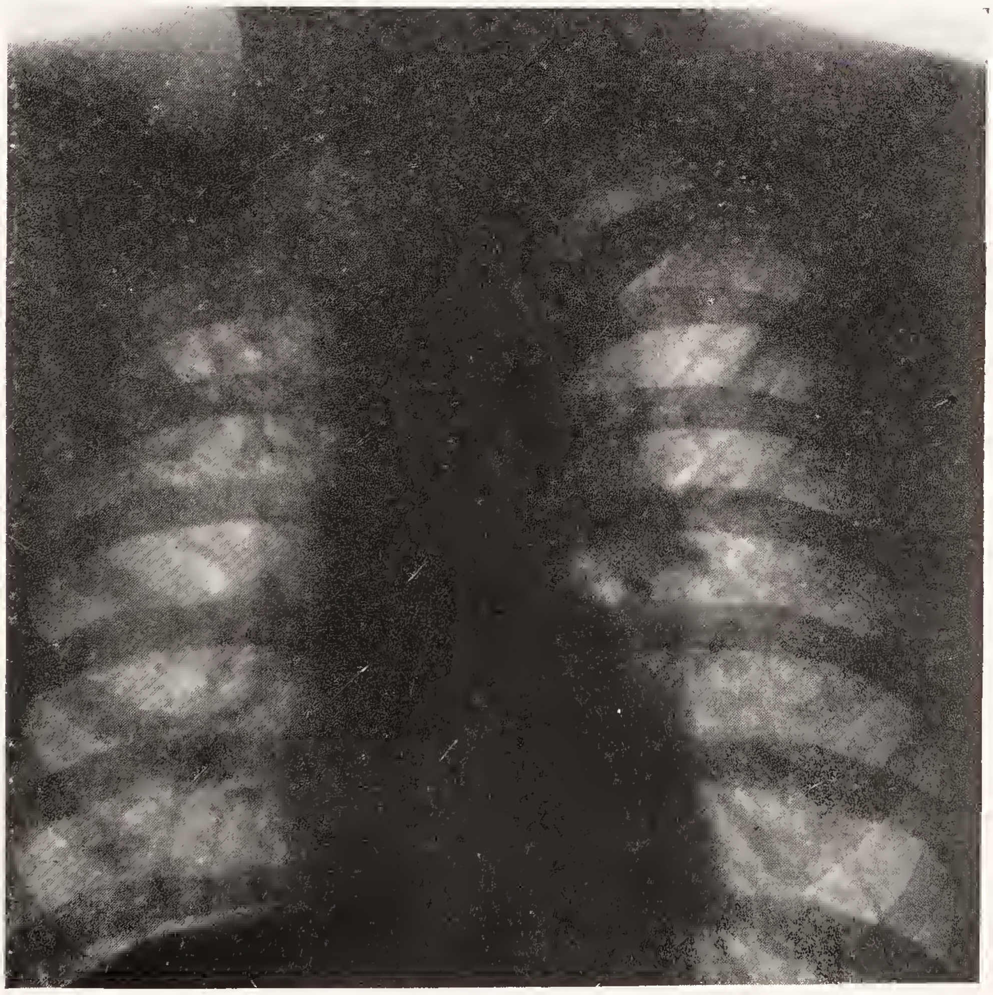
Fourteen of the 20 patients were able to complete a full course of treatment ranging from 5·80 grm. to 7·40 grm. (totals of doses), and in six cases the Sanocrysin was stopped for various reasons. In one of the cases, although the full course was not given, there was definite improvement.

Three cases tolerated Sanocrysin without any reaction ; in the remaining 17 there occurred mild reactions for the most part which were transient in character. One case developed a severe herpetiform rash on the shoulder which was rather persistent during the treatment, and another developed black bullæ on the toes which resembled gangrene in appearance, but ultimately cleared up. Associated with this condition there was tenderness along the course of the arteries of the lower limb which suggested a condition resembling obliterative endarteritis. As regards the type of case in this series the disease in the great majority of cases, according to the X-ray findings, was widespread and usually bilateral. In two cases having artificial pneumothorax Sanocrysin was given in addition : in one there was no improvement and both forms of treatment were discontinued ; in the other case improvement did not begin until after Sanocrysin had been administered.

Again, of the 20 cases, 17 had tubercle bacilli in the sputum before treatment by Sanocrysin, and one had tubercle bacilli in the sputum during treatment. Of these 18 positive sputum cases, 8 lost the tubercle bacilli at the end of the treatment, giving a bacillary loss of 47 per cent. It can be stated that Sanocrysin has a definite effect in causing a

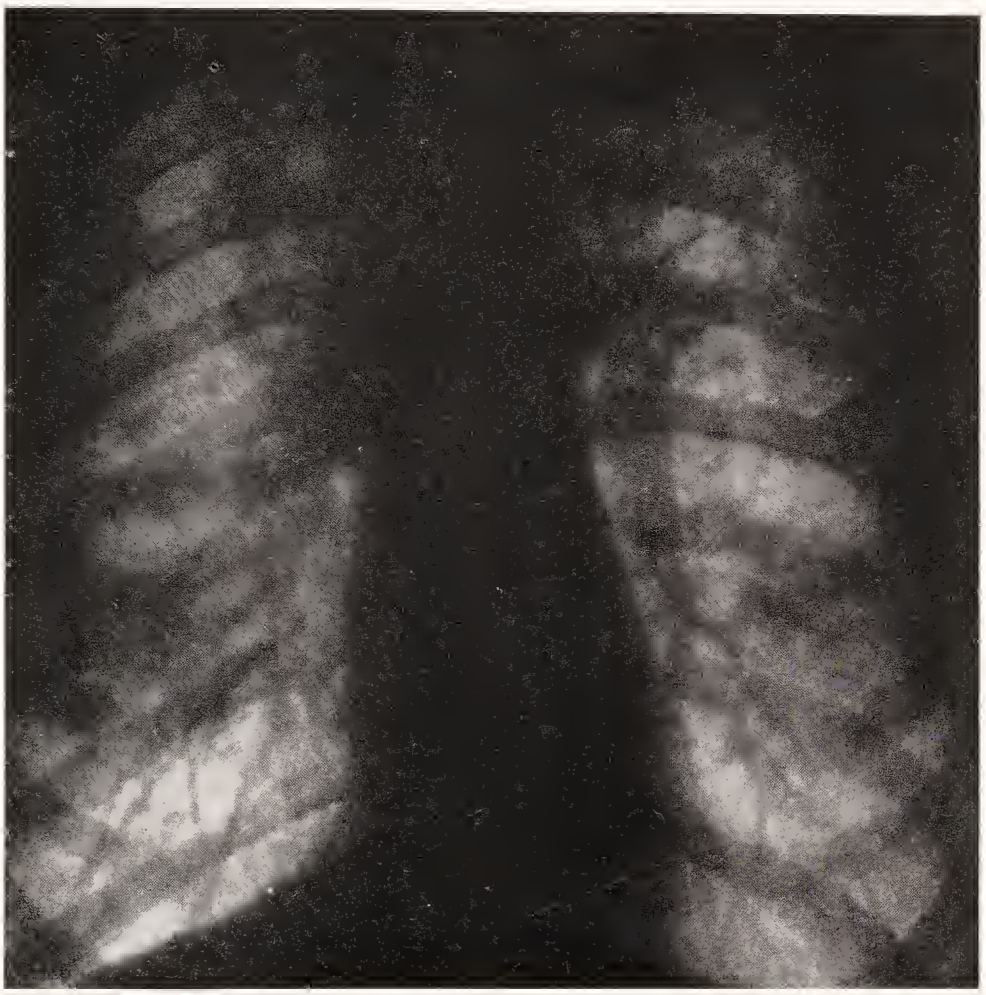


S.3(*a*).—Patient M.W., aged 26, male. Skiagram taken 11/11/29 before Sanocrysin treatment commenced. There is extensive disease involving practically the whole of the right side, and a certain amount of trouble on the left side.

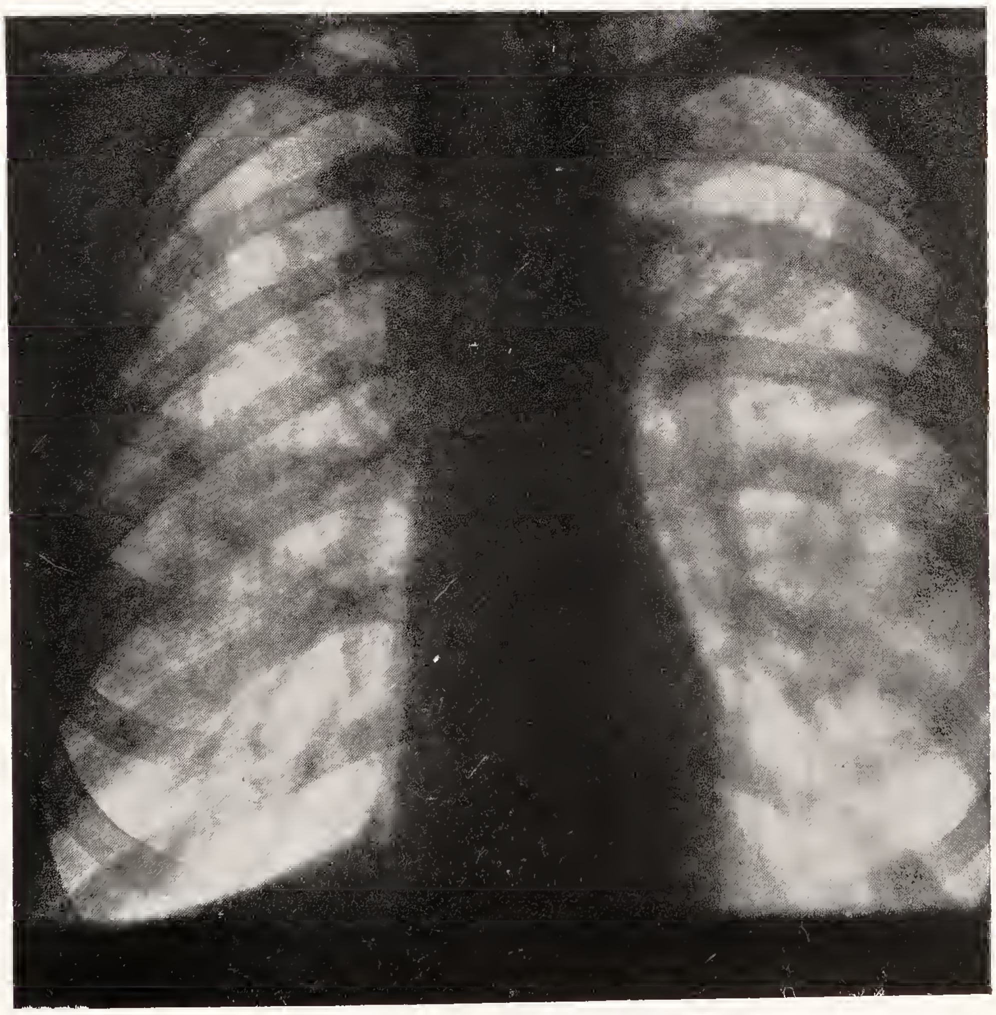


S.3(*b*).—Same patient. Skiagram taken 16/7/30 after course of Sanocrysin treatment. The diseased areas have shrunk considerably, and there is a marked improvement especially in the upper part of the right side.

[*Skiagrams taken at High Carley Sanatorium.*]



S.4(*a*).—Patient F.S., aged 30, male. Skiagram taken 4/11/29 before Sanocrysin treatment commenced shows infiltration at both apices, and in the right lower zone.



S.4(*b*).—Same patient. Skiagram taken 13/1/30 after Sanocrysin treatment shows considerable shrinking of the diseased area on the right side, and the opacity at the right apex has cleared up. On the left side the lesion is becoming more localised.

[*Skiagrams taken at High Carley Sanatorium.*]

disappearance of tubercle bacilli from the sputum as in this group of 17 cases *all* had tubercle bacilli in the sputum after a previous course of sanatorium treatment ; in one case after three years' sanatorium treatment (here the tubercle bacilli disappeared after Sanocrysin had been given and the sputum is still negative) ; in another case the sputum became negative after Sanocrysin treatment but tubercle bacilli reappeared two months after the Sanocrysin treatment was stopped. This case is at present undergoing a second course of Sanocrysin and may again become negative ; improvement in the case is still maintained in every other way.

Sanocrysin tends to cause a more rapid improvement in the X-ray appearances of the lesions than sanatorium treatment alone. In this series of cases there have been no dramatic changes, but on the whole, after Sanocrysin treatment the lesion tends to become more localised and shrunken in size (as is illustrated by skiagrams S. 3(*a*), 3(*b*), S. 4(*a*) and 4(*b*) here reproduced). In fibrotic cases with neighbouring infiltration (exudative lesions) there is frequently a clearing up of the exudative part of the lesion ; the fibrosis, as may be expected, remains the same.

The blood sedimentation test was done in 11 cases and there was improvement in 9 of them. In 7 cases the improvement was very considerable, the average rate of fall of the blood cells being retarded 20 per cent. or over after standing one hour. This test has a certain value in determining the progress of the disease in pulmonary tuberculosis.

As regards the weights of 19 cases, 11 lost weight and 8 gained weight. Of the men patients, 6 lost weight out of 7. This is what one might expect in using a drug possessing toxic properties.

The general tendency is for the temperature and pulse rate to become somewhat steadier after Sanocrysin treatment.

The broad indication for treatment was : no satisfactory improvement under sanatorium treatment.

It will be seen that improvement did not take place in every case, but the sum total shows that quite a number improved, and any remedy that will check the downhill course of the disease, even in a proportion of cases, is useful. Of the 14 cases who received a full course of Sanocrysin treatment 12 improved and two remained stationary. The results of the trial lead one to conclude that Sanocrysin has a definite place in the treatment of pulmonary tuberculosis.

TABLE 5.—Condition of patients who received a course of Sanocrysin treatment at High Carley Sanatorium.

Case.	Sex and Age.	Sputum.		Condition before treatment.	Complications during treatment.	Result of treatment.
		Before	After			
L.E.	F.28	+	—	Extensive disease. No prospect of returning to normal life.	Occasional vomiting.	Much improved in every way.
E.S.	F.22	—	O	Mild definite case, but temperature unsteady. Not progressing satisfactorily.	Albuminuria seven days.	Improved. Temperature stabilised, general condition improved and slight improvement as regards sedimentation.
N.C.	F.23	+	+	Extensive disease.	None.	Improved judged by X-ray and sedimentation. Sputum less.
E.P.	F.22	+	+	Bilateral disease, fulminating type. Persistent pyrexia. General condition poor.	Diarrhœa, toxic condition, rise of temperature.	Definitely worse after gold. Treatment abandoned.
A.R.	F.25	+	+	General condition poor, extensive disease. T.B. very numerous in sputum. Lt. side A.P. attempted but failed.	Slight transient albuminuria. Faint rash. Vague neuralgic pains in feet.	Temperature and pulse more settled. T.B. less numerous in sputum. Gained weight.
I.B.	F.24	+	—	No definite improvement after 3 years' sanatorium treatment. Sputum persistently positive. General condition poor.	Slight staining twice during course.	Sputum became negative. General condition much improved. On full exercise and work.
K.M.	F.46	+	+	Febrile relapses. Persistently positive sputum.	Several sharp febrile reactions, morbilliform rashes, small ulcer in mouth.	Subjectively better. Temperature more stable.
A.E.	F.16	O	O	Extensive bilateral disease. Sanocrysin tried on account of extensive exudative lesion.	Desquamating dermatitis extending all over body, very severe.	Gold stopped on account of severe reactions. In statu quo.
L.T.	F.30	+	+	Extensive disease, exudative and fibrotic.	General irration of skin, pruritis, ulceration of mouth. Pains in limbs and tenderness along arteries of lower extremity. Contramine given.	In statu quo.
D.W.	F.20	+	—	Persistently heavy positive sputum.	Nil.	Sputum became negative, relapsed later and became positive. Second course Sanocrysin commenced.
C.S.	F.33	+	+	Febrile relapses and not making progress with sanatorium treatment.	Vomiting. Severe herpetiform rash right shoulder region and left marked scarring.	Improved X-ray picture. Temperature and pulse rate somewhat steadier. Sanocrysin treatment discontinued. Subsequent improvement with sanatorium treatment.
R.S.	F.24	+	—	Extensive bilateral disease. General condition stationary after twelve months' sanatorium treatment.	Small ulcers in mouth, desquamation extremities, headaches. Contramine given.	Considerable improvement as revealed by skiagram. General condition improved.
D.S.	F.16	+	+	Artificial pneumothorax failed. Temperature unsteady. Patient at a standstill.	Albuminuria	Treatment discontinued owing to reactions and unsteady temperature. In statu quo.

Table 5.—(continued).

Case.	Sex and Age.	Sputum		Condition before treatment.	Complications during treatment.	Result of treatment.
		Before	After			
F.S.	M.30	+	—	Confined to bed on account of raised temperature and general weakness.	Headache and metallic taste. Diarrhœa. Slight febrile reaction after injections.	Much improved in every way. X-ray improvement. Temperature subsided. Patient up and about.
R.T.	M.43	+	+	Patient going slowly downhill. Left A.P. discontinued owing to obliterative pleurisy. Patient willing to try anything.	Corneal ulcer, diarrhœa, abdominal pains, general stomatitis, numerous rashes. Contramine given.	Patient improved, generally brighter. X-ray improvement. Patient unable to tolerate drug. This is unfortunate as it appeared to be doing him good.
J.Mc.	M.26	+	+	Hopeless case, febrile with extensive disease. Sanocrysin tried as a last resort together with A.P.	Diarrhœa.	Worse. Treatment discontinued.
W.H.	M.31	+	+	Extensive bilateral disease.	None.	Much improved judged by X-ray. Less T.B. in sputum. General condition very good.
F.H.	M.20	+	—	Disease extending.	Metallic taste. Postules on hands.	Temperature and pulse steadier. Slight improvement in X-ray appearances.
T.M.	M.23	+	—	Positive sputum after six months' sanatorium treatment. Spread of disease as revealed by skiagram.	Sublingual ulcer. Occasional rise in temperature. Slight vomiting.	Improvement of X-ray picture. Sputum has remained negative.
M.W.	M.26	—	—	Satisfactory A.P. on right side failed to check course of disease and patient appeared to be going steadily downhill. General condition poor.	Severe febrile reactions caused Sanocrysin to be withheld for a time but resumed later with small gradually increasing doses. Sputum positive during treatment.	General condition much improved. Patient up and about whereas previously confined to bed. Temperature and pulse steady.

Summary and Conclusions.

1. Of the 14 adult patients (five male, nine female) suffering from pulmonary tuberculosis who completed a course of Sanocrysin treatment, 12 showed definite improvement and two were unaffected.

2. Although Sanocrysin treatment is not a specific cure, I would advise serious consideration of its use for patients who do not respond to ordinary sanatorium treatment.

3. Sanocrysin treatment should not be abandoned in any given case without a patient trial by carefully spacing the intervals between the doses if reactions occur ; one case in the series took 33 weeks to complete the full course but the result fully justified the length of time taken.

4. The most tangible results of Sanocrysin treatment are : (a) its effect on the sputum, tending to cause disappearance of bacilli ; and (b) improvement of the lesions in the lungs as evidenced by skiagrams taken before and after treatment.

THE EFFECT OF IRRADIATED MILK IN THE TREATMENT OF TUBERCULOSIS.

In view of the beneficial results claimed by Dr. David Nabarro (London) (1), Dr. Chalmers Watson (Edinburgh) (2), and a number of German research workers, in the treatment of rickets by irradiated milk (that is, milk exposed to ultra-violet rays), it was suggested by certain of the experimenters that similar good results might be obtainable in the treatment of certain other diseases including tuberculosis. The object of irradiation is to introduce the valuable vitamin D into the milk and so give the patient the benefit by ingestion. As irradiated milk was considered *prima facie* a possible aid to the treatment of tuberculosis, the County Council authorised a trial to be carried out by Dr. E. H. Allon Pask, the medical superintendent of the Oubas House Children's Sanatorium, Ulverston, where twenty-one girls up to fifteen years of age, diagnosed and notified as suffering from tuberculosis, mainly pulmonary, were under treatment. Dr. Pask has furnished the report which now follows.

Milk which has been subjected to irradiation is a convenient form of administering vitamin D, and it is claimed that, as the milk is given in a fresh condition, there is no danger of the vitamin D content deteriorating as might conceivably be the case with other preparations containing vitamin D (*e.g.*, cod liver oil).

The milk purchased for the Oubas House Children's Sanatorium is grade A milk, that is, milk produced under hygienic conditions from herds examined quarterly by a veterinary surgeon, who certifies that the cows are free from clinical tuberculosis. It was thus grade A milk which was subjected to irradiation by the Scholl system, the apparatus being obtained on loan from the British Hanovia Quartz Lamp Co., Ltd. The system in question consists in passing the milk, which has been treated with carbon dioxide gas to render it oxygen free, into a water-cooled chamber containing a quartz mercury vapour lamp, which is the source of the ultra-violet rays. The milk is passed at the rate of one pint in 75 seconds in a very thin film into a tank at a distance of three inches from the lamp and run into a receptacle.

Samples of the grade A milk before irradiation and after irradiation were taken and submitted for examination as to vitamin D content.

Controlled tests were made on rats for vitamin D or antirachitic activity; four litters of rats were used with the following results :—

TABLE 6.

Litter.	Grade A Milk.	
	Non-irradiated.	Irradiated.
A.	No vitamin D.	1 c.c. contains half a unit of vitamin D.
B.	do.	1 c.c. contains one unit of vitamin D.
C.	do.	1 c.c. contains half a unit of vitamin D.
D.	do.	1 c.c. contains half a unit of vitamin D.

The tests showed that the non-irradiated milk contained no vitamin D but that the amount of vitamin D actively generated in the milk at Oubas House as the result of the irradiation process was quite good, the half unit per cubic centimetre being greater than generally recorded during trials in other places.

The trial at Oubas House was commenced early in 1930, and extended over three months. The ages of the children ranged from five years to fourteen years. Children under ten years of age were given half-a-pint of irradiated milk per day, and those over ten years three-quarters of a pint per day. The usual ration of milk being one-and-a-half pints per day per child, the irradiated milk was substituted for an equivalent amount of non-irradiated milk.

The milk after irradiation resembled in taste ordinary milk to which soda water had been added. No difficulty was experienced in persuading the children to take it, and no ill effects resulted from the treatment.

Eleven patients (average age 10·45 years) were put on the irradiated milk, and five patients (average age 8·0 years) not put on irradiated milk were used as a control. Of the eleven cases receiving the irradiated milk, nine were of pulmonary tuberculosis (three of which had a positive sputum) and there were two cases of abdominal tuberculosis. Of the five controls, four were cases of pulmonary tuberculosis and one was a case of abdominal tuberculosis.

The general condition of the patients after the three months' trial was as given below :—

	Improved		Stationary		*Maximum variation
Cases treated with irradiated milk—					
Pulmonary cases, 9 ...	4	6=54·5%	5	5=45·5%	±20·2%
Abdominal cases, 2 ...	2		–		
Control cases on non-irradiated milk—					
Pulmonary cases, 4 ...	2	3=60%	2	2=40%	±29·5%
Abdominal cases, 1 ...	1		–		

It will be seen from the above figures that there was very little difference in the progress made in the two groups of cases—in fact, there is a slight advantage in favour of the control cases. As regards the abdominal cases, in one case on irradiated milk the girth of the abdomen at the level of the umbilicus was 2 inches less after treatment, but the control abdominal case also showed a similar reduction.

A study of the temperature and pulse rates does not show any appreciable change after the three months' course of irradiated milk. Four of the pulmonary cases receiving irradiated milk had an evening temperature of 100° F. or over before commencing the course, and this was the same at the termination of the treatment. Cases that were afebrile before the irradiated milk treatment remained afebrile during and after the course of treatment. The same remarks hold for the control group of cases.

A record of the weights was taken over a period of three months before the test and during the three months of the test. All the children gained more weight during the three months previous to the commencement of the test than during the three months' test (average gain for the children who later had irradiated milk, 2·8 lbs., and for the control group, 3·0 lbs.) ; this is explained by the fact that all sanatorium patients gain weight most rapidly during the initial period of treatment. The average gain in weight of the eleven cases treated with irradiated milk was 1·9 lbs. per patient, and of the control cases 0·9 lbs. per patient.

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*Twice times "probable error." The "probable error" has been calculated on the formula $0{\cdot}6745\sqrt{\frac{p\,q}{n}}$, p being the percentage of cases which improved, q the percentage which remained stationary, and n the total number of cases in the group.

This is the formula given by Sir Arthur Newsholme in *The Elements of Vital Statistics* (p. 510).

Thus it would appear that irradiated milk was responsible for gain in weight, but when one takes into account the probable errors in the averages due to chance it is found that there is no significant difference in the two figures. For the cases treated with irradiated milk the maximum variation ([redacted], TAKEN AS twice times "probable error") is ±0·8, and for the control cases ±0·4. Therefore, no safe deduction can be drawn from the figures.

The three positive sputum cases on irradiated milk still remained positive at the end of the test. There was no change to be noted in the sputum of the other cases.

As regards the physical signs in the chest, the nine pulmonary cases on irradiated milk showed no change in four cases, improvement in two and extension of disease in three cases. In the control cases there was improvement in two instances and no change in the other two. Here the improvement as regards the physical signs of the pulmonary cases is much better in the control group of cases as compared with the cases on irradiated milk.

Skiagrams of the chest were taken of all the pulmonary cases before and after treatment. After a careful comparison the following results were noted: in the cases treated with irradiated milk there was improvement in three cases (two of these showing slight evidence of calcification), no change in four, and deterioration in two. For the control cases improvement was noted in all four cases (in one of them there was evidence of calcification). The X-ray evidence of improvement is therefore considerably in favour of the control group of cases.

It has been pointed out by other research workers that overdosage of vitamin D might cause premature ossification of the growing bones due to over-stimulation: as a check of any such change, skiagrams of the bones in the neighbourhood of the knee and wrist joints were taken in four cases before and after the course of irradiated milk, but there was no evidence in the skiagrams of premature ossification.

The blood sedimentation test (see Table 7) was carried out in ten of the eleven cases on irradiated milk and on all five control cases. This test consists in the estimation of the rate of fall of the red cells, the blood being left to stand in a glass tube; the figures in the following table represent the height of the column of red cells at the bottom of the tube, at intervals of two and five hours, expressed as a percentage of the whole column of fluid. In pulmonary tuberculosis, among other diseases, the rate of fall is accelerated, and as the patient improves the tendency is for the rate of fall to become slower.

Table 7—Blood Sedimentation Tests.

Case No.	Classification.	Age.	Height of column of red cells in the tube expressed as a percentage of the whole column of fluid.				Observations.
			Before trial		*After* trial		
			2 hours after test	5 hours after test	2 hours after test	5 hours after test	
(a) Results of 11 cases treated with irradiated grade A milk.							
			%	%	%	%	
1.	T. B. Minus	12	50·00	42·11	43·85	36·84	Worse.
2.	T. B. Plus 2	14	39·66	39·66	33·33	30·00	Worse.
3.	T. B. Minus	13	56·20	47·37	56·45	45·15	Inconsistent.
4.	do.	12	82·00	68·00	80·55	66·66	Worse.
5.	T. B. Plus 2	8	45·00	43·33	44·26	40·98	Worse.
6.	T. B. Minus	8	50·00	48·34	45·20	41·09	Worse.
7.	do.	9	63·63	48·72	65·57	52·45	Improved.
8.	do.	7	59·65	43·86	54·00	48·00	Inconclusive.
9.	Tub. Abdomen	9	61·84	58·19	90·00	48·33	Inconclusive.
10.	do	5	81·82	61·84	53·45	41·37	Worse.
11.	T. B. Plus 3	14	Not examined.				—
	Mean.	—	58·98	50·14	56·66	45·08	Rate of fall at 2 hours, 2·32 per cent. increase. Rate of fall at 5 hours, 5·06 per cent. increase.
	*Probable error of mean	—	±2·88	±1·90	±3·5	±2·00	
(b) Results of 5 cases treated with non-irradiated grade A milk.							
			%	%	%	%	
12.	T. B. Minus	9	73·34	65·00	76·00	66·00	Improved.
13.	do.	6	40·00	38·34	58·34	50·00	Improved.
14.	do.	6	88·34	43·34	68·96	43·10	Worse.
15.	do.	9	65·51	41·37	82·25	53·22	Improved.
16.	Tub. Abdomen	12	48·34	46·67	60·00	50·00	Improved.
	Mean.	—	63·10	46·94	69·11	52·46	Rate of fall at 2 hours, 6·01 per cent. decrease. Rate of fall at 5 hours, 5·52 per cent. decrease.
	*Probable error of mean	—	±5·24	±2·85	±2·77	±2·28	

For footnotes see page 24.

Summary and Conclusions.

1. For three months early in 1930 a trial was carried out by Dr. E. H. A. Pask at the Oubas House Children's Sanatorium, Ulverston, in order to ascertain the effect, if any, on tuberculous children of milk which had been exposed to ultra-violet radiation by means of the Scholl apparatus.

2. Grade A milk as supplied to the sanatorium was used. The effect of irradiation on this milk, as revealed by a biological test on rats, was good as measured by the vitamin D content of 0·5 units per c.c., which is above the average obtained in similar irradiation by other research workers.

3. The trial was made on eleven girls (aged 5 to 14 years, average 10 years), nine of whom had pulmonary tuberculosis (six with sputum negative or absent and three with positive sputum) and two abdominal tuberculosis. They were given irradiated milk varying from half-a-pint to three-quarters of a pint per day according to age : they received non-irradiated milk to make up to one-and-a-half pints per day. Five girls (age group 5 to 14, average 8 years), four of whom had pulmonary tuberculosis (all with sputum negative or absent) and one abdominal tuberculosis, served as the control group, receiving non-irradiated grade A milk but otherwise undergoing the same treatment and routine as the other patients.

4. The result of the test showed that the eleven girls on irradiated milk did not make any better progress than the five control cases, except that the average gain in weight of the cases on irradiated milk (1·9 lbs.) was twice as much during treatment as that of the control cases (0·9 lbs.)—a difference which, on statistical formula, is, however, insignificant owing to the probable error due to chance in selection. A comparison of the two groups favoured the control patients when tested by physical signs, general condition, course of disease as revealed by X-rays and blood sedimentation test.

5. No ill effect on the patients was observed during the trial.

6. The result of the trial, although made on small numbers, does not justify, in my opinion, the use of irradiated milk as a routine part of sanatorium treatment.

7. It is possible that a similar trial on tuberculous patients living at home might have yielded different results, as many factors which

obtain in sanatorium treatment are missing in home treatment coupled with dispensary supervision. For instance, at Oubas House the children receive heliotherapy as a part of their treatment and it may be that an adequate amount of vitamin D is obtained from this source.

References.

(1) Nabarro (D.) and Hickman (J. L.): *The Lancet*, 18–1–30, p. 127.

(2) Watson (C.) and Finlay (T. Y.): *The Lancet*, 5–10–29, p. 704.

Notes on Table 7.

*The " probable error of the mean " has been calculated on the formula :

$$0{\cdot}6745 \frac{\sigma}{\sqrt{n}}$$

σ = standard deviation.
n = numbers of tests in average, *viz.*, 10 and 5.

The " standard deviation " is calculated by dividing the sum of the squares of the deviations from the average by the number in the average, and extracting the square root.

This formula is given by Sir Arthur Newsholme in *The Elements of Vital Statistics* (p. 509).

III.—ARTIFICIAL PNEUMOTHORAX TREATMENT OF PULMONARY TUBERCULOSIS.

The treatment of pulmonary tuberculosis by artificial pneumothorax is the most widely practised of the several methods adopted for lung cases in recent years. The treatment consists in putting a diseased lung wholly or partly out of action by effecting its collapse within the chest. This is attained by the injection—within the chest wall and outside the lung itself—of a volume of air or other gas under low pressure. Such injections have to be repeated at varying intervals in order to maintain the collapse. The treatment is carried out under X-ray control so as to determine the amount or efficiency of collapse and the need for renewal of the gas. Naturally this form of treatment calls for careful handling and makes material demands on the physician's time.

Treatment is commenced on suitable cases whilst at the sanatorium or pulmonary hospital. On discharge, after some six months' stay, the patient is referred to the dispensary near his home and it then falls to the consultant tuberculosis officer for the particular area to continue the treatment by giving renewals of air or gas, each consultant having at his disposal an X-ray apparatus situated in most cases at his chief dispensary. A patient may require artificial pneumothorax treatment extending over several years.

In regard to the results of artificial pneumothorax treatment, there is no doubt that many patients, who would by the ordinary methods have gone steadily downhill, have received inestimable benefit, and some have even progressed as far as cure.

Artificial pneumothorax treatment is carried out at all the County sanatoria and hospitals where there is an X-ray apparatus, *e.g.*, High Carley, Elswick, Peel Hall, Rufford, and Withnell. At these institutions the medical superintendent is his own radiologist, which is valuable in enabling him to exercise control of the treatment.

As an example of the technique and results of treatment by artificial pneumothorax, I have requested Dr. E. H. Allon Pask, the medical superintendent of the High Carley Sanatorium, and Dr. G. Jessel, the medical superintendent of the Peel Hall Pulmonary Hospital, and consultant tuberculosis officer for Dispensary Area No. 4, to contribute the following reports and notes on cases treated by them, together with a number of illustrative skiagrams. Artificial pneumothorax has not yet reached the stage of standardisation, so each doctor has been allowed to explain his own technique.

REPORT BY DR. E. H. ALLON PASK ON ARTIFICIAL PNEUMOTHORAX TREATMENT AT THE HIGH CARLEY SANATORIUM.

Artificial pneumothorax treatment was commenced at High Carley Sanatorium in 1916. At that time oxygen was used for the primary induction on account of the supposed danger of gas embolism, and atmospheric air was used for the refills. It is perhaps interesting to record that the composition of the gas in the pleural space twenty-four hours after an initial induction of pure oxygen consisted of that of alveolar air, *viz.*, 79·76 per cent. nitrogen, 15·34 per cent. oxygen, and 4·9 per cent. of carbon dioxide. Sir Leonard Hill, who was at the time doing some research on metabolism at High Carley, kindly performed the gas analysis for me. The use of oxygen for the primary induction has been abandoned, and atmospheric air is now used throughout.

As regards the technique of the operation, a pointed needle with an aperture at the side is used for the induction as well as the refills; this technique has been found very satisfactory in practice. The Rivière trochar for inductions I have abandoned owing to the fact that it is difficult to introduce without first incising the skin, as there is a considerable shoulder at the junction of the trochar and cannula, and when introduced, the end of the cannula is apt to press against the lung and thus get an imperfect oscillation in the manometer. No special preliminary preparation of the patient is made beyond a purgative the evening before. The skin and extra pleural surface is anæsthetised with novocain and adrenalin solution. No morphia is given beforehand, and the primary induction is done quickly and quietly with a view to upsetting the patient as little as possible.

I have fortunately had no experience of pleural shock, the most alarming complication noticed being in a case in which the air leaked from the pleural cavity through the posterior mediastinum, and tracked up the neck behind the trachea and larynx, causing considerable swelling, dyspnoea, and dysphagia for a time, but ultimately clearing up.

When artificial pneumothorax treatment was commenced at High Carley Sanatorium, the refills were given at longer intervals, and larger doses were employed than at present. The method now employed is smaller doses at shorter intervals. Whilst the latter method has a more scientific basis in keeping the intrapleural pressure at a more constant level I am not convinced that the results are appreciably better, and the percentage of cases developing fluid remains the same.

The problem as to when to do a pneumothorax is not an easy one. An early case with a lesion confined to one apex will, speaking generally, respond quite well to sanatorium treatment. This type of case should undergo a period of sanatorium treatment before the question of artificial pneumothorax is considered because, whilst the operation in itself is practically without risk, in other respects the possibility of the development of an effusion or lighting up trouble on the other side must always be kept in mind. If, however, the sputum does not diminish in quantity and remains positive, then artificial pneumothorax should be inducted.

As regards effusion arising during artificial pneumothorax treatment, the number of cases which have developed fluid to any extent have been very small, *i.e.*, 12 per cent. I have ignored those cases which have less fluid than obliterates the outline of the dome of the diaphragm completely. One case in which there was a large effusion did extremely well, but this was left alone, the fluid acting as the compressing agent. An unsatisfactory type of case is that in which the lung re-expands at the extreme base and the fluid develops on a shelf: if means are not taken to prevent this the cough and sputum tend to increase. Oleothorax in such cases might do good.

The results of artificial pneumothorax treatment in unilateral disease encourage one to employ this form of treatment in bilateral disease to the side having most trouble. Whilst the results in this latter type of case are sometimes satisfactory for a time at any rate, naturally the results to be expected are not so good as in unilateral lesions, and in assessing results of artificial pneumothorax treatment as a whole, this fact must be borne in mind. Again, artificial pneumothorax treatment is employed as an emergency measure in cases of hæmoptysis, and here again the results will not be uniformly as satisfactory as in carefully selected unilateral cases.

Artificial pneumothorax is employed for other conditions besides pulmonary tuberculosis. At present I have a case of bronchiectasis (see skiagram A.P.1) in which it has relieved the symptoms considerably; the patient has now been on this treatment for eight months. Before artificial pneumothorax was commenced he was frequently off work with hæmoptysis, but since this treatment was given he has had no recurrence, and the amount of sputum is also considerably less; he has a refill every fourteen days, and a fews days before this is due the sputum commences to increase in quantity.

Artificial pneumothorax is also useful as an aid to diagnosis, especially in cases of suspected new growths of the thorax, as the outline of the tumour is frequently much better delineated when air is injected into the pleural cavity. The accompanying skiagrams (A.P. 2(*a*) and 2(*b*)) of a case of lymphadenoma of the mediastinum illustrate this point, and it will be seen that the limits of the tumour are much better defined after artificial pneumothorax.

One case was treated with oleothorax (olive oil with 5 per cent. gomenol). This case was originally a spontaneous pneumothorax which developed a large clear serous effusion. After numerous aspirations the pleura still tended to refill, and the fluid finally became turbid. The fluid was aspirated and temporarily replaced by air, and later the air was withdrawn and 600 c.c. of gomenol-olive oil inserted by means of a Dieulafoy's aspirator. This operation has been repeated several times and the accumulation of fluid is less rapid than before the oleothorax was commenced. No reaction has resulted from the insertion of the gomenol-olive oil. The patient is still undergoing treatment. When the pleural fluid is being withdrawn, towards the end of such withdrawal oil commences to come from the needle. The aspiration is then terminated and more gomenol is put in. (See skiagrams A.P. 3(*a*) and 3(*b*)).

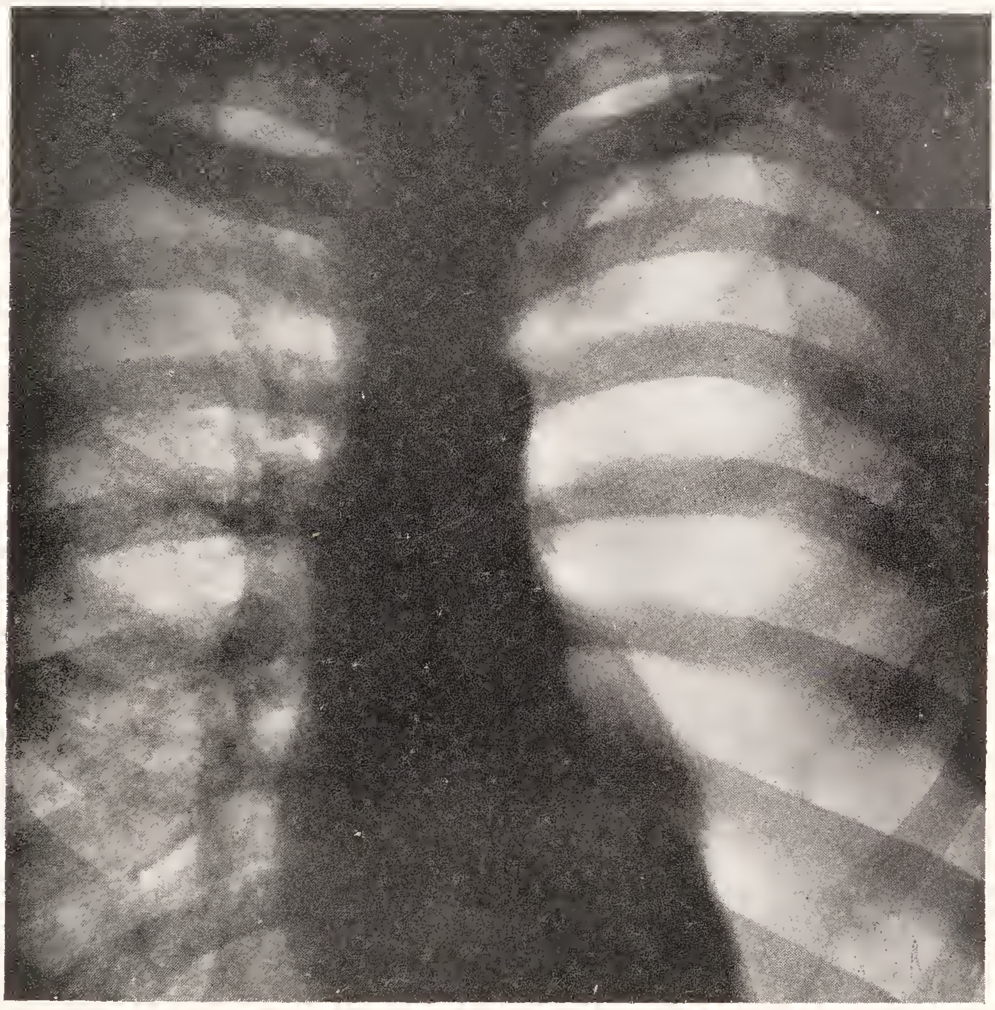
Gomenol-olive oil was tried in a case of artificial pneumothorax where there was difficulty in the patient being able to get refills on leaving the sanatorium. If the lung were compressed by oil instead of air, the intervals for refills would be lengthened. After two injections of small amounts of oil (20 c.c.) the reaction was considerable, causing pain and a rise of temperate owing to the pleura being too sensitive. the patient was unable to stay in the sanatorium for further treatment and consequently the oleothorax could not be continued.

Artificial pneumothorax treatment was first attempted in 1916, and so far 51 cases have been treated ; a satisfactory collapse was obtained in 34 of these cases, or 66 per cent. Of the 34 cases 15 were women and 19 men. In the women's group of 15 cases the *left* side was collapsed in 13 ; contrariwise, in the men's group of 19 cases, the *right* side was collapsed in 14. These figures are curious, and it is difficult to explain why the left side should be commoner in women.

Taking the past five years, there were 22 successful cases of artificial pneumothorax, and the after-results have been ascertained as in the following Table 8 :—

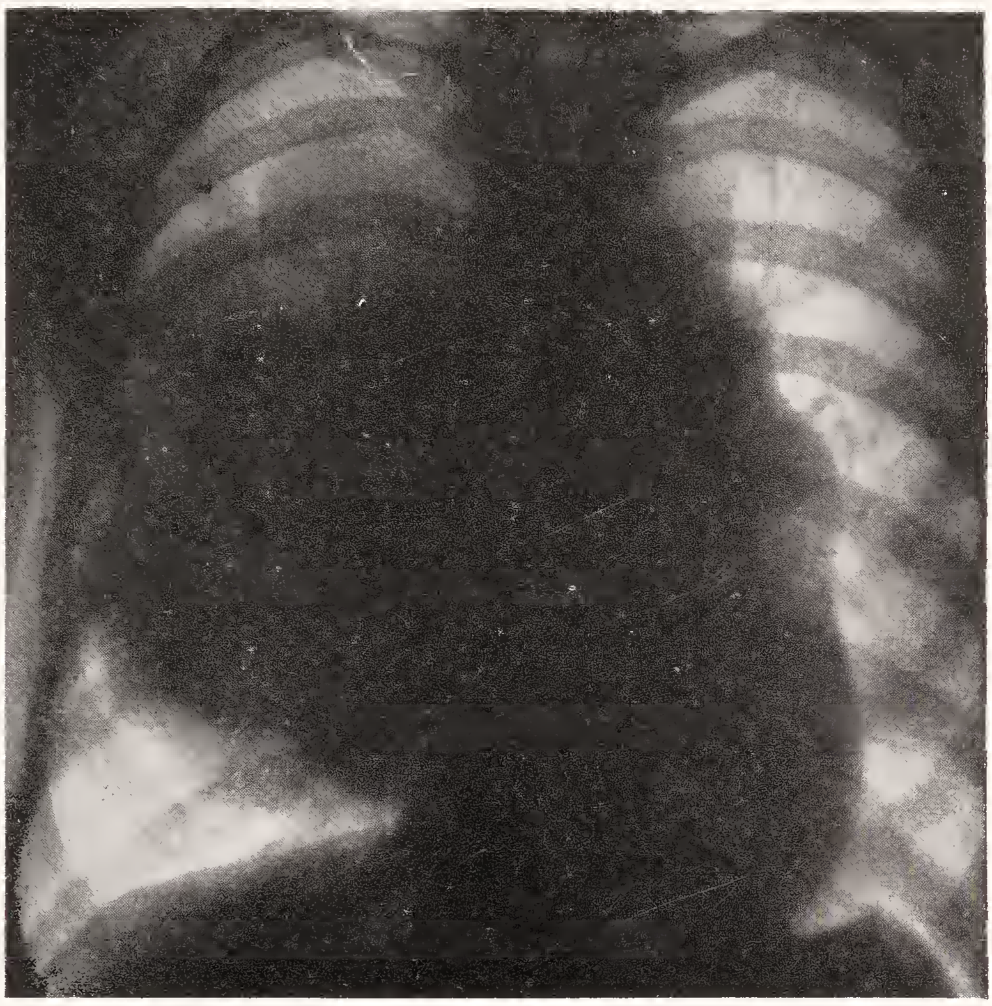
Period since induction.	No. of cases.	No. of cases alive.	No. of cases dead.	Percentage of cases alive.
5 years	5	3	2	60·0
4 years	3	2	1	66·6
3 years	4	3	1	75·0
2 years	3	2	1	66·6
1 year	7	5	2	71·4
Total	22	15	7	68·1

SKIAGRAM ILLUSTRATING ARTIFICIAL PNEUMOTHORAX.

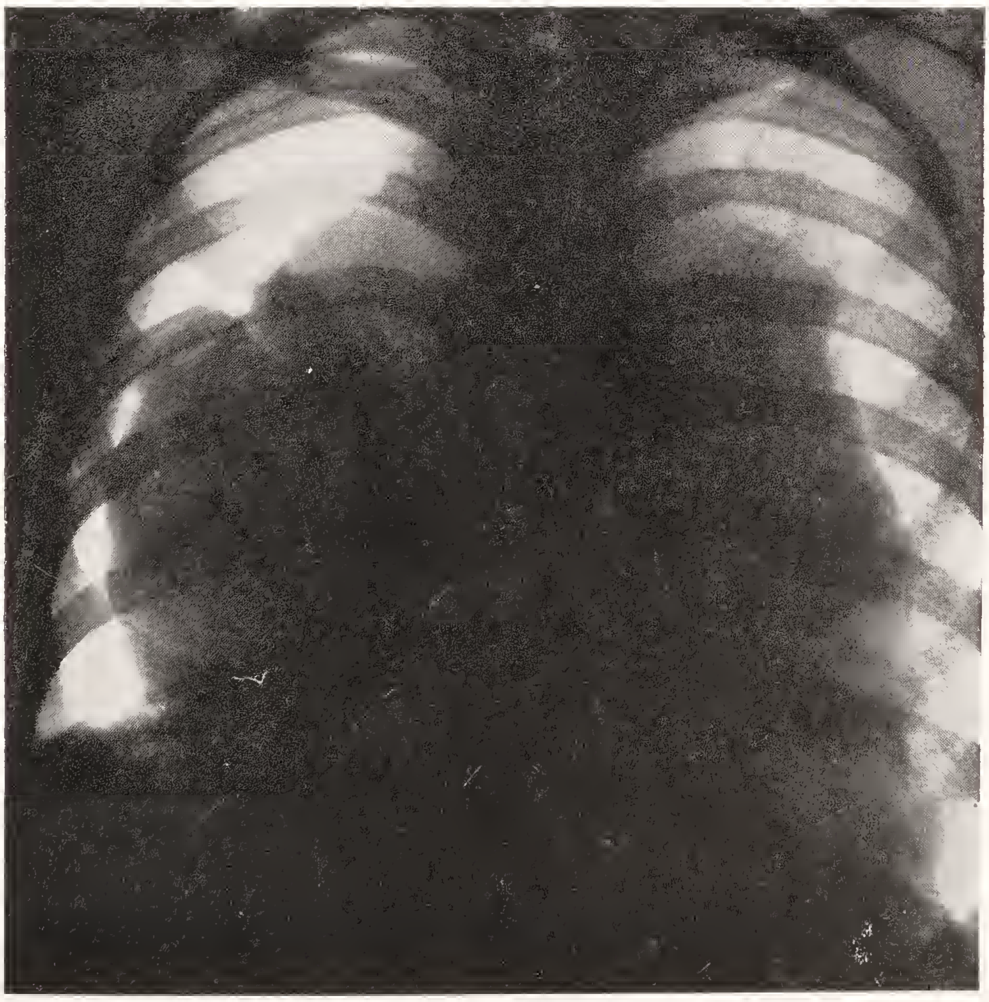


A.P.1.—Patient, R.R., aged 30, male. A case of bronchiectasis treated with artificial pneumothorax. Sputum never positive. Skiagram shows the almost complete collapse of the left lung. Treatment was undertaken for recurrent hæmoptysis, which ceased with artificial pneumothorax treatment. Sputum considerably diminished. Patient has been able to continue at work during treatment.

[*Skiagram taken at High Carley Sanatorium.*]

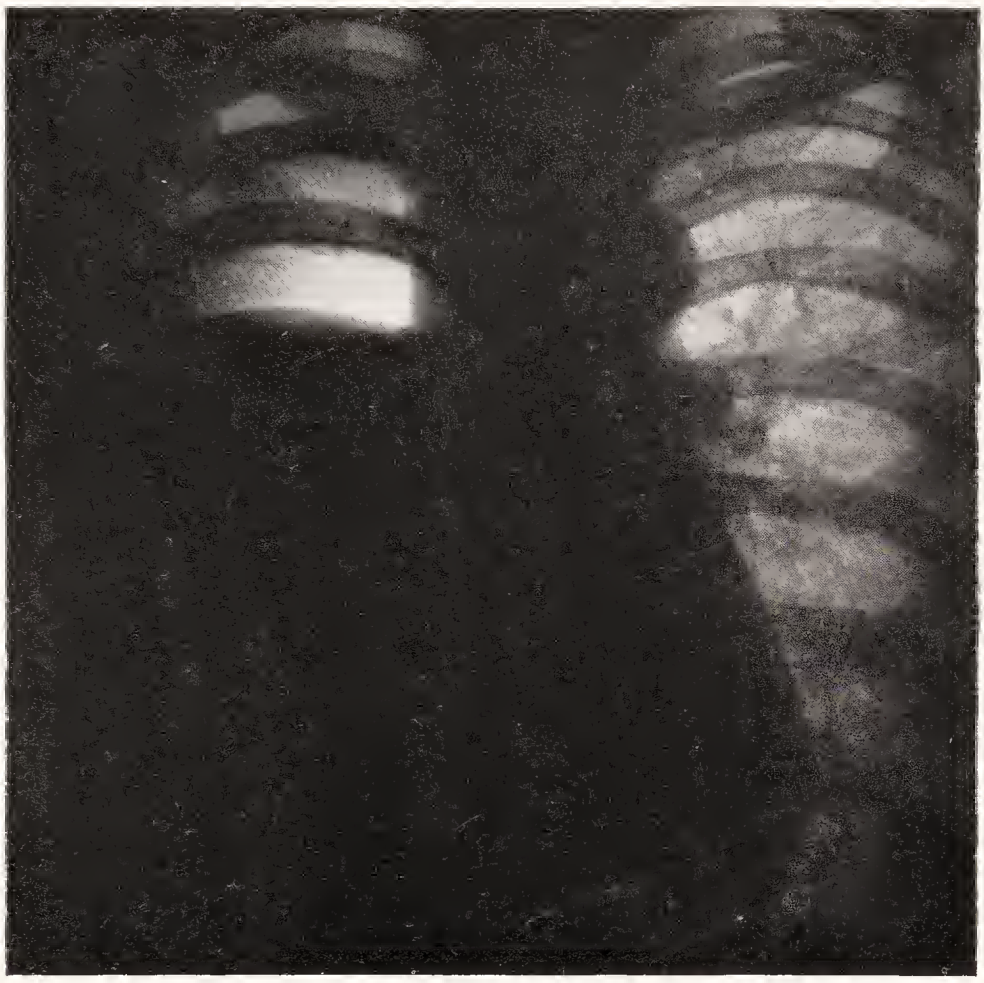


A.P.2(*a*).—Patient A.M., aged 21, female. Skiagram taken 21/10/29 shows large intra-thoracic tumour, lymphadenoma, on right side of chest.

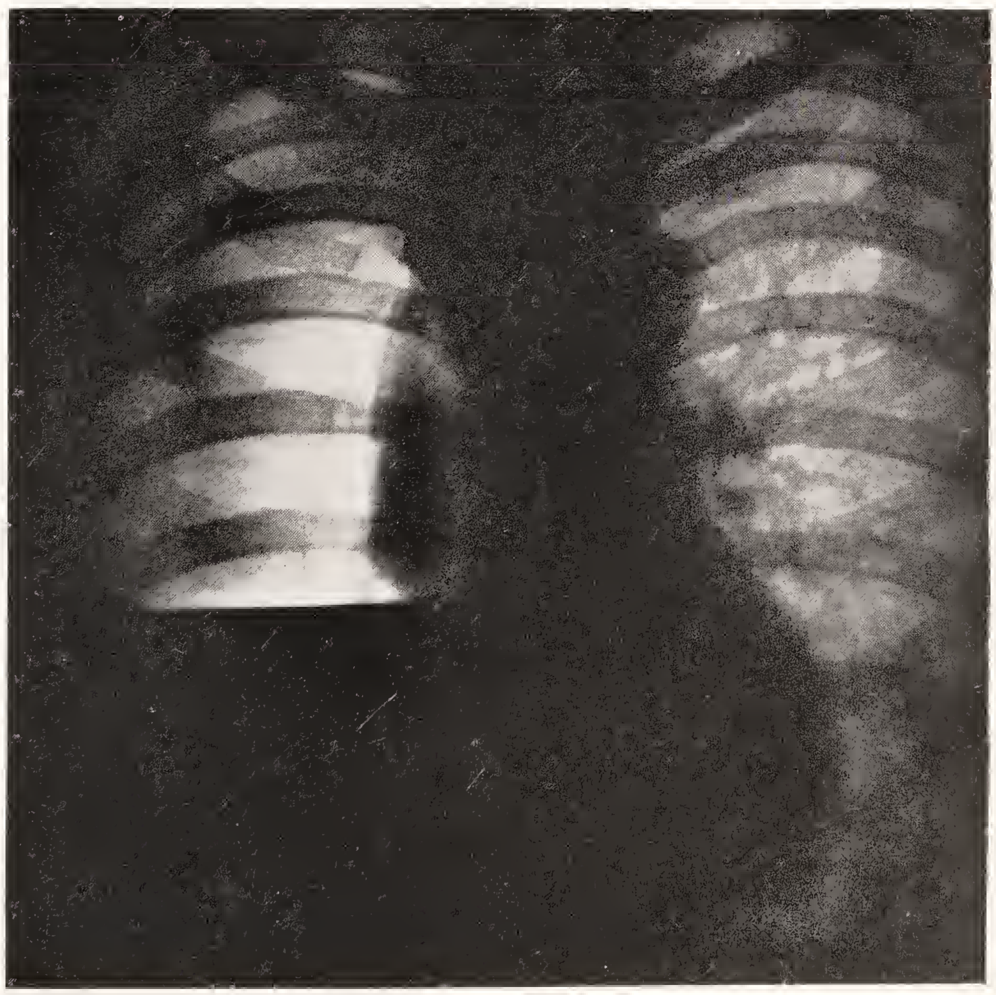


A.P.2(*b*).—Same patient. Skiagram taken 17/2/30 after injection of 450 c.c. of air into the right pleural cavity. Note the outline of tumour is much better defined as a result of the artificial pneumothorax.

[*Skiagrams taken at High Carley Sanatorium.*]



A.P.3(*a*).—Patient L.M., aged 24, female. Skiagram taken 14/2/30 immediately before treatment by oleothorax (gomenol-olive oil). A case of hydro-pneumothorax, the pleural fluid being turbid and containing numerous tubercle bacilli.



A.P.3(*b*).—Same patient. Skiagram taken same day after withdrawal of turbid fluid from chest and replaced by air and 600 c.c. of gomenol-olive oil. Operation has been repeated several times, and the accumulation of fluid is less rapid than before oleothorax commenced. Patient still under treatment.

[*Skiagrams taken at High Carley Sanatorium.*]

All the cases in the foregoing table had a positive sputum, and up to the time of leaving the sanatorium nine became negative, giving a bacillary loss of 40·9 per cent.

Summary and Conclusions.

1. Artificial pneumothorax treatment was first attempted at the High Carley Sanatorium in December, 1916, and since that date 51 adult patients with positive sputum have been treated, with a satisfactory collapse in 34 cases.

2. Artificial pneumothorax treatment in selected cases is a most valuable adjunct to sanatorium treatment.

3. A larger percentage of cases on artificial pneumothorax treatment lose tubercle bacilli from the sputum than do cases receiving sanatorium treatment alone. At High Carley 40·9 per cent. of patients on artificial pneumothorax treatment lost tubercle bacilli as against 18·0 per cent. for the last five years for patients receiving sanatorium treatment alone.

4. Artificial pneumothorax treatment is useful in the treatment of certain cases of bronchiectasis in relieving symptoms.

5. Artificial pneumothorax assists in the diagnosis of obscure chest conditions, especially new growths.

REPORT BY DR. G. JESSEL ON ARTIFICIAL PNEUMOTHORAX TREATMENT AT THE PEEL HALL PULMONARY HOSPITAL.

The following notes are based upon eighteen months' practical experience of this form of treatment at the Peel Hall Pulmonary Hospital, previous sporadic cases and dispensary refills being excluded from the present report. As, however, it is usually considered that artificial pneumothorax treatment should be continued for a period of two to three years, any views, based on the work so far carried out there, can only have a tentative value. It is clear that the value of any form of treatment must be considered in relationship to the material available for its application. The fifty-five beds at Peel Hall are for the most part filled by male patients suffering from acute febrile or chronic advanced disease, early cases finding their way to sanatoria. Here, as elsewhere, it has been found that a substantial proportion of such cases, as are admitted to pulmonary hospitals, respond favourably to the application of sanatorium methods, *i.e.*, rest, fresh air, good feeding, and occupation-therapy when they are afebrile and fit for exercise. These patients are, therefore, excluded from the present survey. There are, however, many who fail to give so satisfactory a response, particularly the acute cases occurring more especially in young adults, and there is ample room for the addition of special forms of treatment to the basic routine of sanatorium methods.

Rest has long been regarded as a sheet anchor in treatment, and artificial pneumothorax is a specialised form of rest, the damaged lung being gradually collapsed and prevented from expanding by the introduction of air within the chest wall. It is usually considered that this should only be attempted when the greater part, at any rate, of the opposite lung is free from disease, and X-ray control is essential.

With the installation of an X-ray apparatus in the late summer of 1928, it became possible to undertake artificial pneumothorax treatment systematically, and from the beginning of 1929 every case admitted has been considered from this point of view. All cases that appeared *a priori* suitable are dealt with in the present report, which covers the period from 1st January 1929 to 31st May 1930. During this period 182 definite cases of pulmonary tuberculosis were admitted, and artificial pneumothorax was seriously considered in 44 cases. One patient declined ; in nine cases it was subsequently considered unnecessary or undesirable, and in the remaining 34 cases it was attempted.

In regard to the nine cases where artificial pneumothorax was not attempted, the reasons were : (*a*) the probability of the disease responding favourably to ordinary measures, (*b*) the patient's age or other contra-indication. The average age of these patients was 48 years. In three of the cases tubercle bacilli were not present in the sputum, and in all nine the disease was of the slow fibrotic type. It is significant that the opinion formed with regard to these nine patients was fully justified by results, as all have done well.

There thus remained 34 patients, who were considered after a brief waiting period (usually under a fortnight) as unlikely to respond favourably to the usual methods of treatment without some additional measures. In 29 tubercle bacilli were present, and in the remaining five there was definite X-ray evidence of tuberculosis with active symptoms and signs. The average age of this group of 34 patients was 33 years. It is interesting to note that, whereas the average age of seven patients, in whom artificial pneumothorax was impossible owing to adhesions, was 36 years, and the average age of six patients, in whom the treatment was discontinued, was 34 years, the ages of 21 men, in whom a satisfactory collapse was maintained, was only 31·8 years. Thus, the greatest success was obtained with the younger men, who frequently derive less benefit from ordinary sanatorium measures than older patients.

The apparatus used throughout was Lillingston & Pearson's, this being found simple and effective. Prior to induction an injection of omnopon was given and a local anæsthetic of 2 per cent. novocain in 1 in 1,000 adrenalin used at first, but in refills this was usually discarded as unnecessary. Rivière's trochar with cannula was used for induction, then Lillingston's needle for first refill, subsequently a Saugman's needle. Gas replacement was carried out by means of a trochar and cannula or hollow needle with rubber tubing attached, the amount of replacing air being always calculated so as to be less than the equivalent of fluid removed. No accidents of any kind occurred. The patients' co-operation has been excellent, and by keeping them together in two wards, a spirit of mutual hope and encouragement has prevailed. The amount of air given has varied with the build of the patient, usually 200–300 c.c. air being given daily for three days; then the amounts were gradually increased, refills being given at intervals of 2, 4, 7, 10, 14 and 21 days. By this time efficient collapse had been obtained or the presence of adhesions ascertained. The aim has been to obtain as good collapse as possible, but to avoid high pressures, keeping end pressures somewhere round $-2+2$. It has been considered undesirable to give refills at long intervals. After each refill a skiagram was taken, and it has been proved that definite pressure readings in a given patient will produce identical pictures after refills. X-ray screening is, of course, useful, when permanent records are not required. As regards side, the inductions given or attempted were right-sided in 18 cases, left-sided in 14 cases and bilateral in two cases. The bilateral cases were undertaken owing to spread of disease to the other lung after induction on the worse side had been begun, and to the failure or unsuitability of Sanocrysin owing to gastro-intestinal disturbance. Temporary relief of symptoms and improvement was undoubtedly obtained, but in such cases the prognosis cannot be regarded as particularly hopeful.

In 7 of the 34 cases, failure occurred at the outset owing to adhesions. (*N.B.*—It was the custom to make attempts at three different sites before abandoning the effort.)

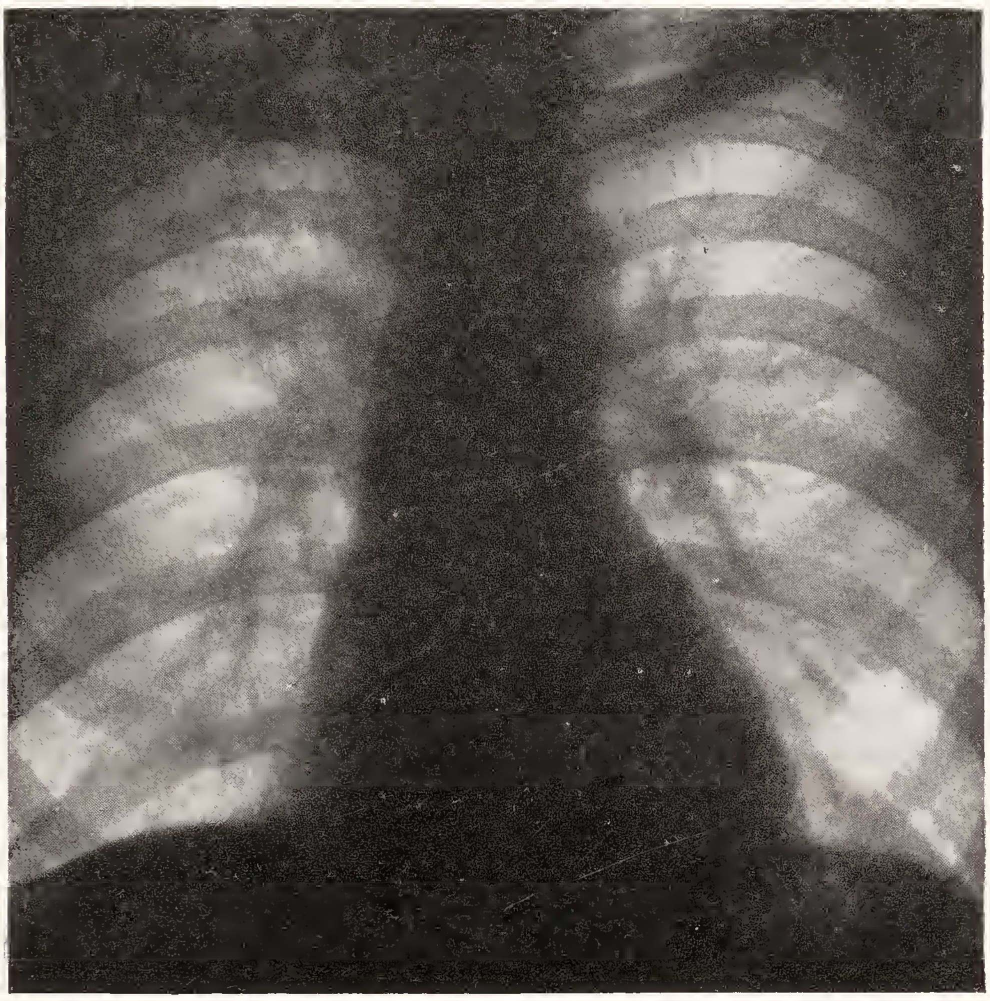
In 6 of the 34 cases, treatment was discontinued owing to insufficient collapse on account of adhesions or unwillingness of patient to continue.

This leaves 21 cases where good, though not necessarily complete, collapse was obtained. In eight of these, adhesions were found, and effusions occurred in eleven. Gas replacement was considered desirable and was performed in six of these cases of effusion; the remaining five cases maintained their improvement without gas replacement. In three cases hæmoptysis was a definite indication for the induction of artificial pneumothorax.

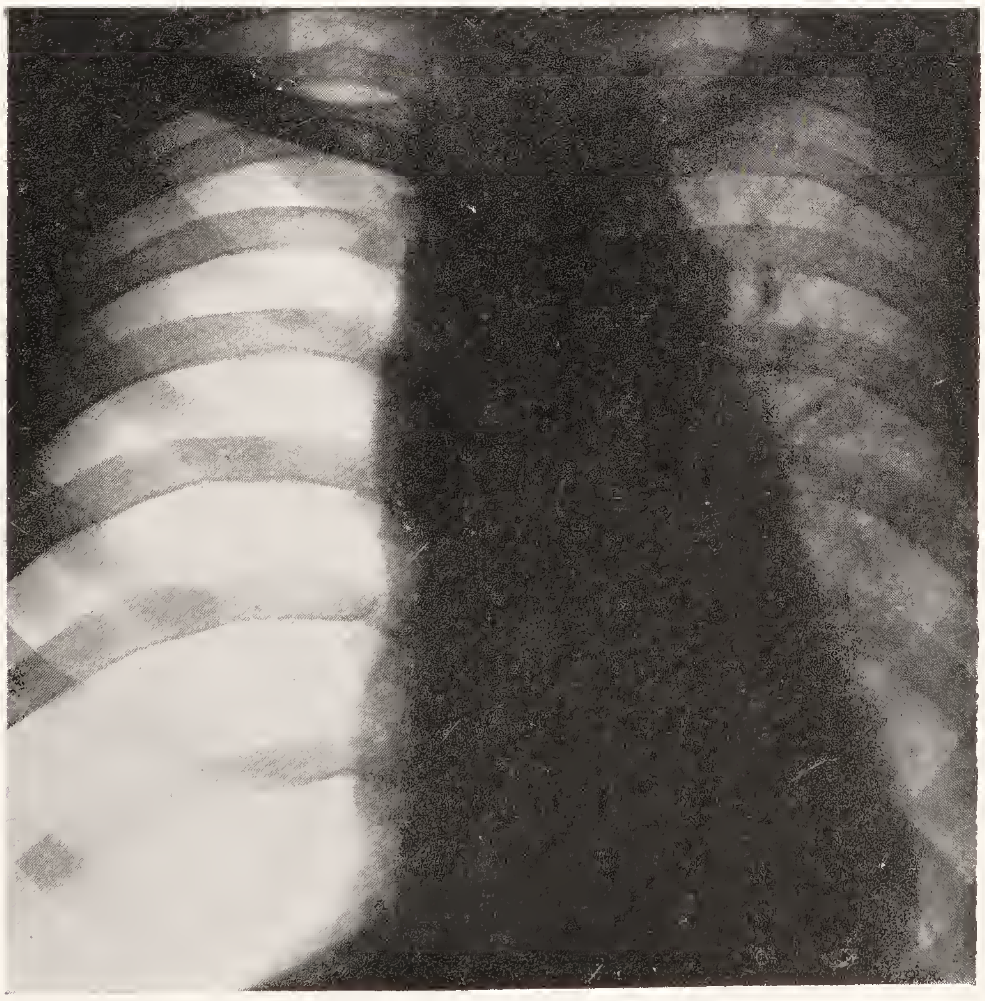
The condition of the 21 patients in whom a satisfactory collapse was obtained, as ascertained in June 1930, is contained in the following table :—

TABLE 9.—PEEL HALL—ARTIFICIAL PNEUMOTHORAX.

Hosp. No. of case.	T.B.	Age.	Side.	Complications.	Gas Replacement.	Result.	Remarks (June, 1930).
1119	+	20	R.	Adhesions Effusion	Yes	Improved	Fit for work. Effusion during dispensary refills.
1078	+	38	L.	Effusion	—	Improved	Working.
1189	+	49	R.	Effusion	—	Improved	Up all day.
1135	+	19	L.	Effusion	Yes	Improved	Up. Gardening.
1184	+	25	R.	—	—	Improved	Up. Gardening.
1179	+	28	R.	Effusion	—	Improved	Up.
1146	+	49	R.	Effusion	—	Improved	Onset hæmoptysis. Up. Acts as poultry-man.
1028	+	22	R.	Effusion	Yes	Not improved	Improvement at first, subsequently relapsed.
1212	+	46	R.	—	—	Improved	Up.
1206	+	19	R.	Adhesions	—	Improved	Up all day.
1098	+	28	L.	—	—	Improved	Working. Having refills at dispensary.
1222	—	39	R.	—	—	Improved	X-ray : disease R. upper third and L. apex. Up.
1155	+	47	L.	—	—	Improved	Fit for work. Having refills at dispensary.
1150	—	17	R.	Adhesions Effusion	—	Improved	Up.
1223	+	38	L.	—	—	Improved	Marked reduction of toxemia. Temperature falling.
1105	+	37	R.	Adhesions	Yes	Improved	Onset hæmoptysis. Up all day.
1039	+	23	R.	Adhesions Effusion	Yes	Not improved	Did well in hospital. Up and about. Relapsed later.
1193	+	32	R.	Effusion	Yes	Not improved	Febrile. In bed. Tending towards improvement. Brother died acute T.B.
1199	—	44	L.	Adhesions	—	Improved	Up. Gardening.
1187	+	23	R.&L.	—	—	Not improved	Red-haired lad. L. side first, spread to R. side. Gastro-intestinal symptoms.
1111	+	25	R.&.L	Adhesions	—	Not improved	Onset hæmoptysis. R. side first, spread to L. side. Gastro-intestinal symptoms.

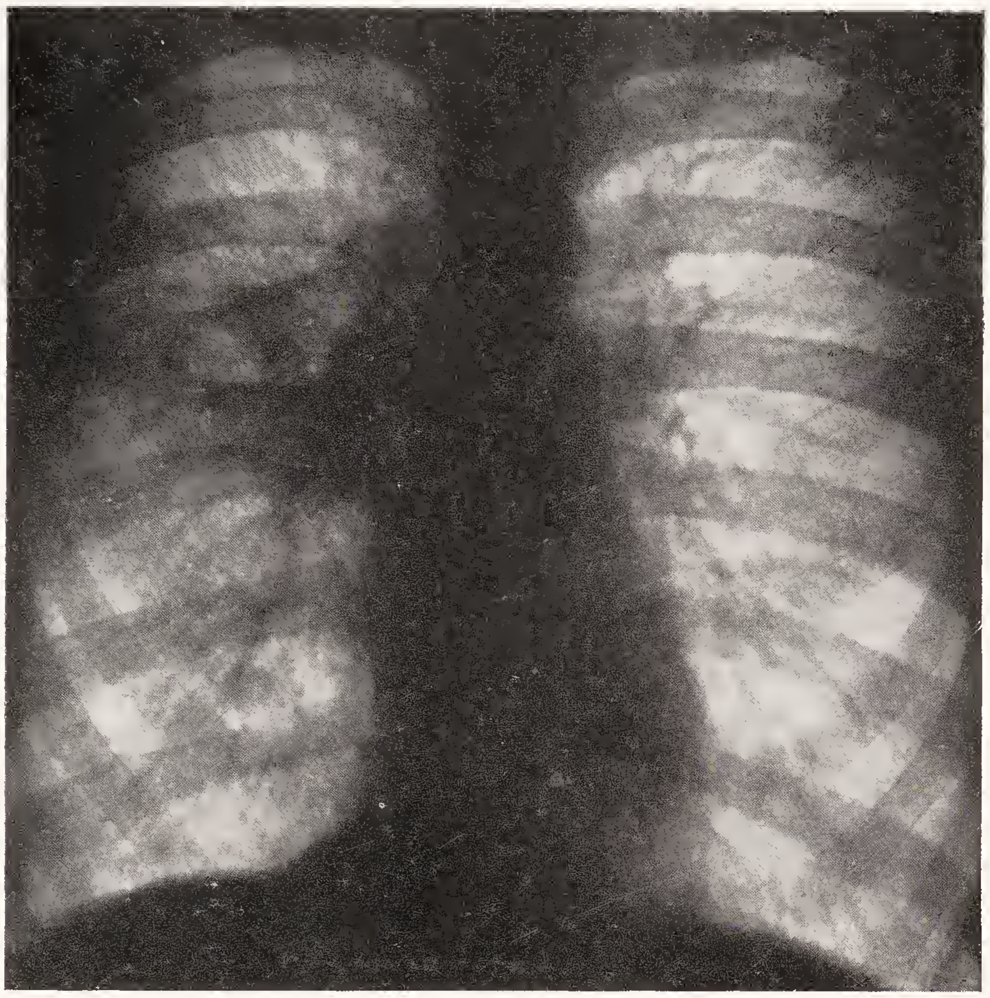


A.P.4(*a*).—Patient J.T., aged 32, male, sputum positive. Skiagram taken 18/2/30 shows condition on admission, mottling in upper third of right lung.

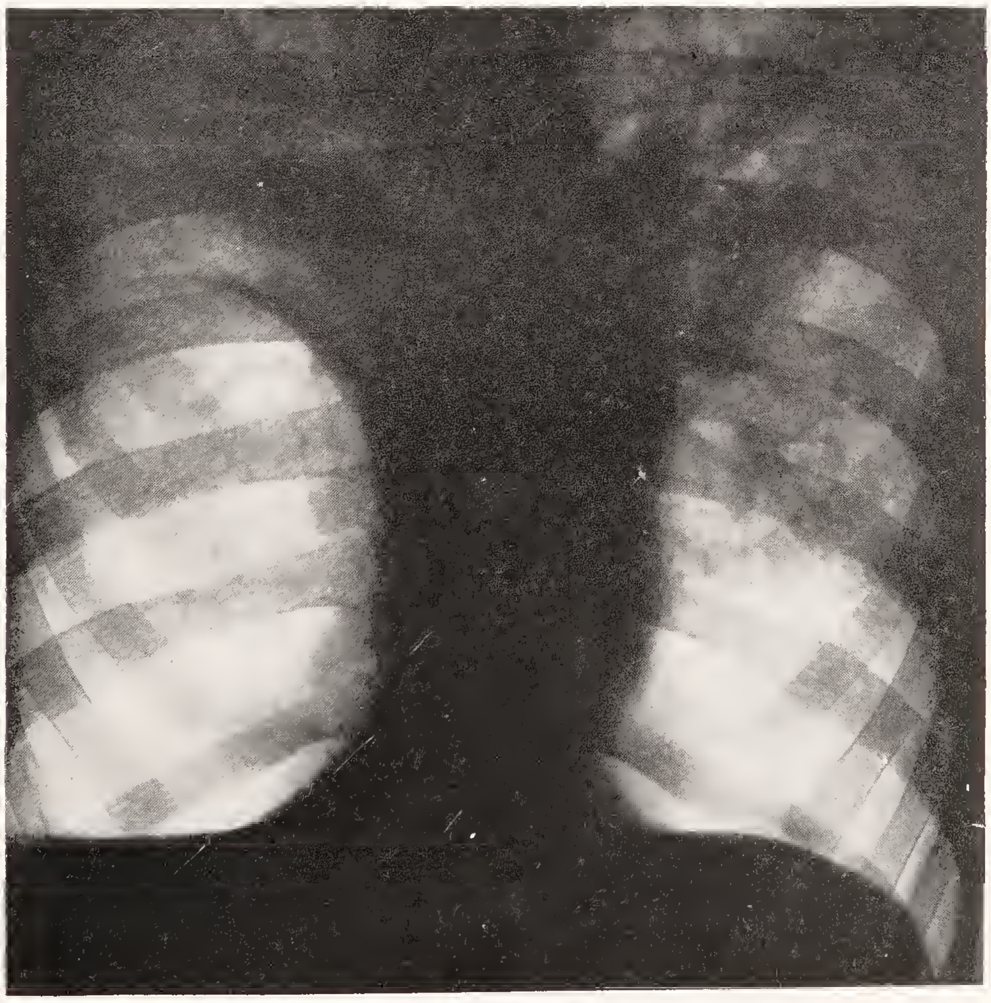


A.P.4(*b*).—Same patient. Skiagram taken 20/3/30 shows complete collapse of right lung.

[*Skiagrams taken at Peel Hall Pulmonary Hospital.*]

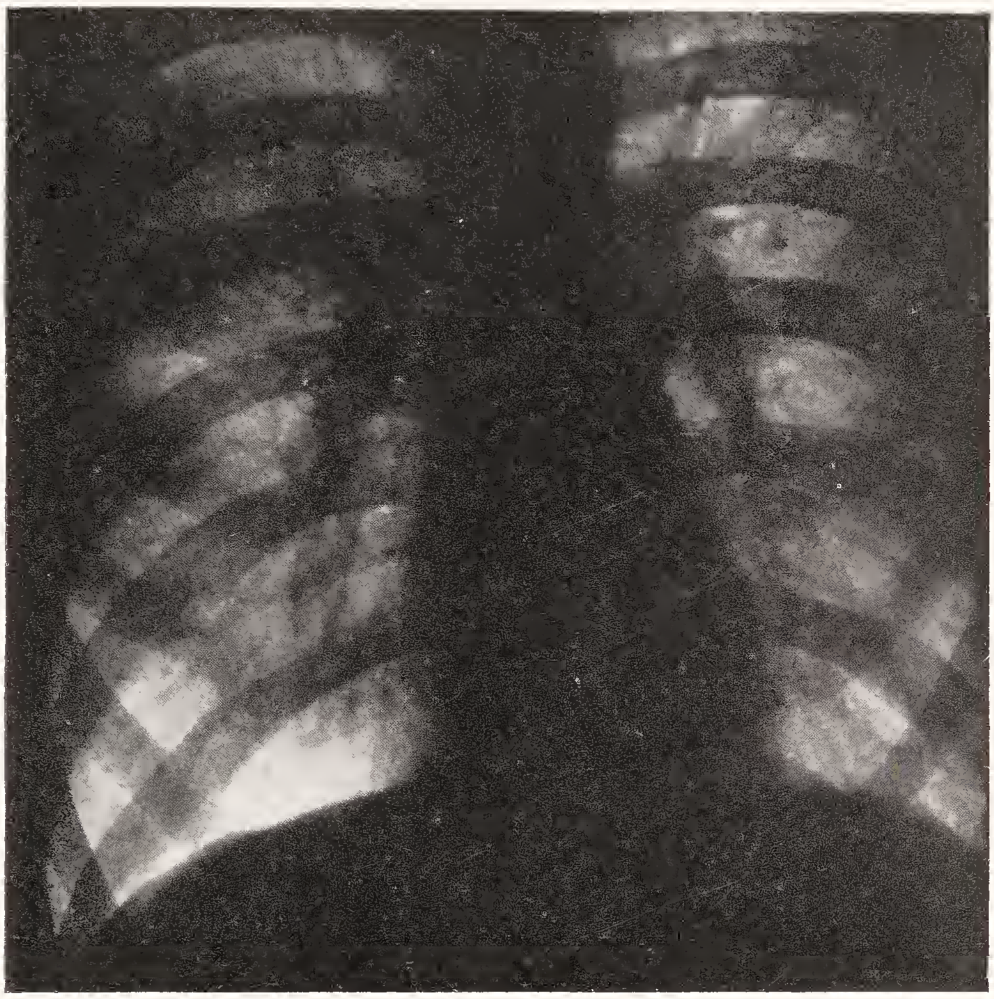


A.P.5(*a*).—Patient T.V., aged 25, male, sputum positive. Skiagram taken 12/7/29 shows condition on admission; note cavity in right lung. Patient febrile and had hæmoptysis.

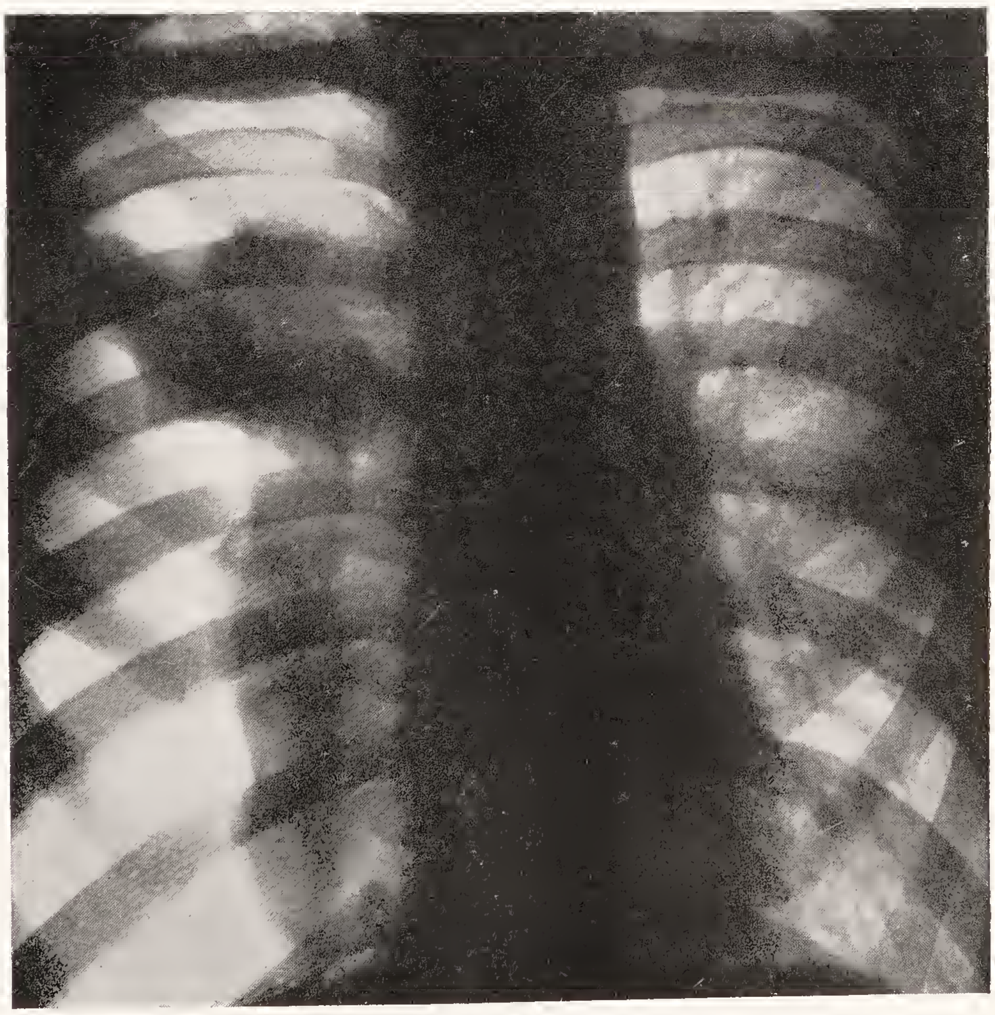


A.P.5(*b*).—Same patient. Skiagram taken 7/7/30. After the induction of artificial pneumothorax on the right side the disease subsequently spread to the left lung and artificial pneumothorax was produced on this (left side). The skiagram shows the case as now being one of bi-lateral artificial pneumothorax. Patient afebrile and doing well.

[*Skiagrams taken at Peel Hall Pulmonary Hospital.*]

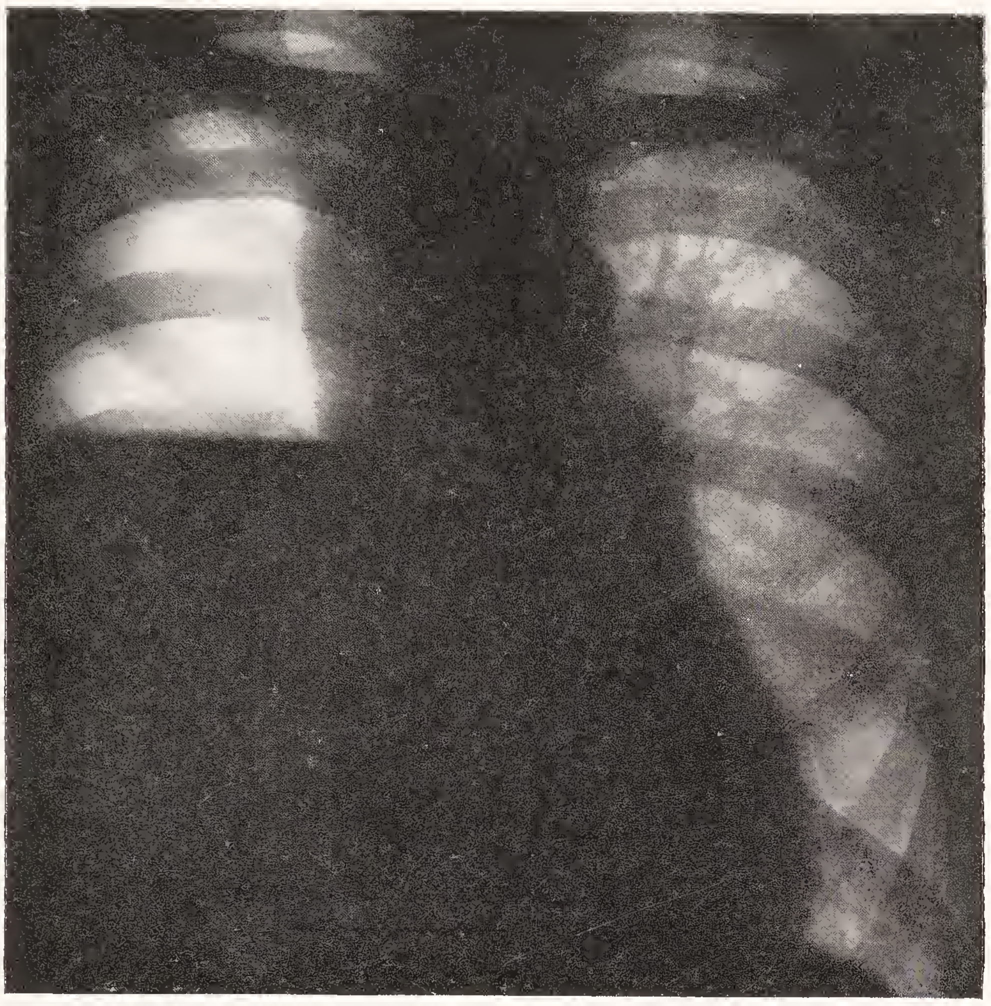


A.P.6(*a*).—Patient A.K., aged 19, male, sputum positive. Skiagram taken 2/4/30, before artificial pneumothorax, shows mottling right infraclavicular region and upper middle zone.

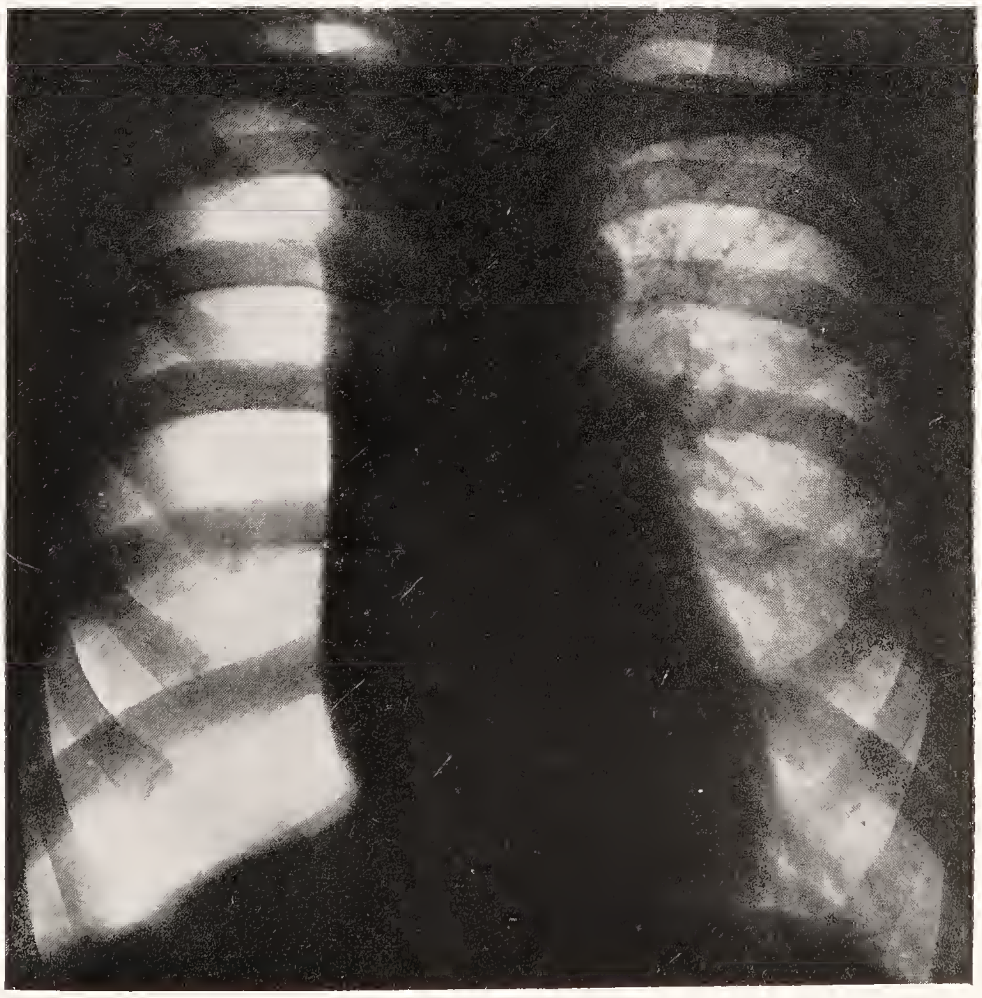


A.P.6(*b*).—Same patient. Skiagram taken 29/4/30 after induction of artificial pneumothorax on right side; illustrates presence of thick adhesions, the lung being anchored to chest wall. Patient made good progress, and two months later he was able to be up all day and work in the garden.

[*Skiagrams taken at Peel Hall Pulmonary Hospital.*]



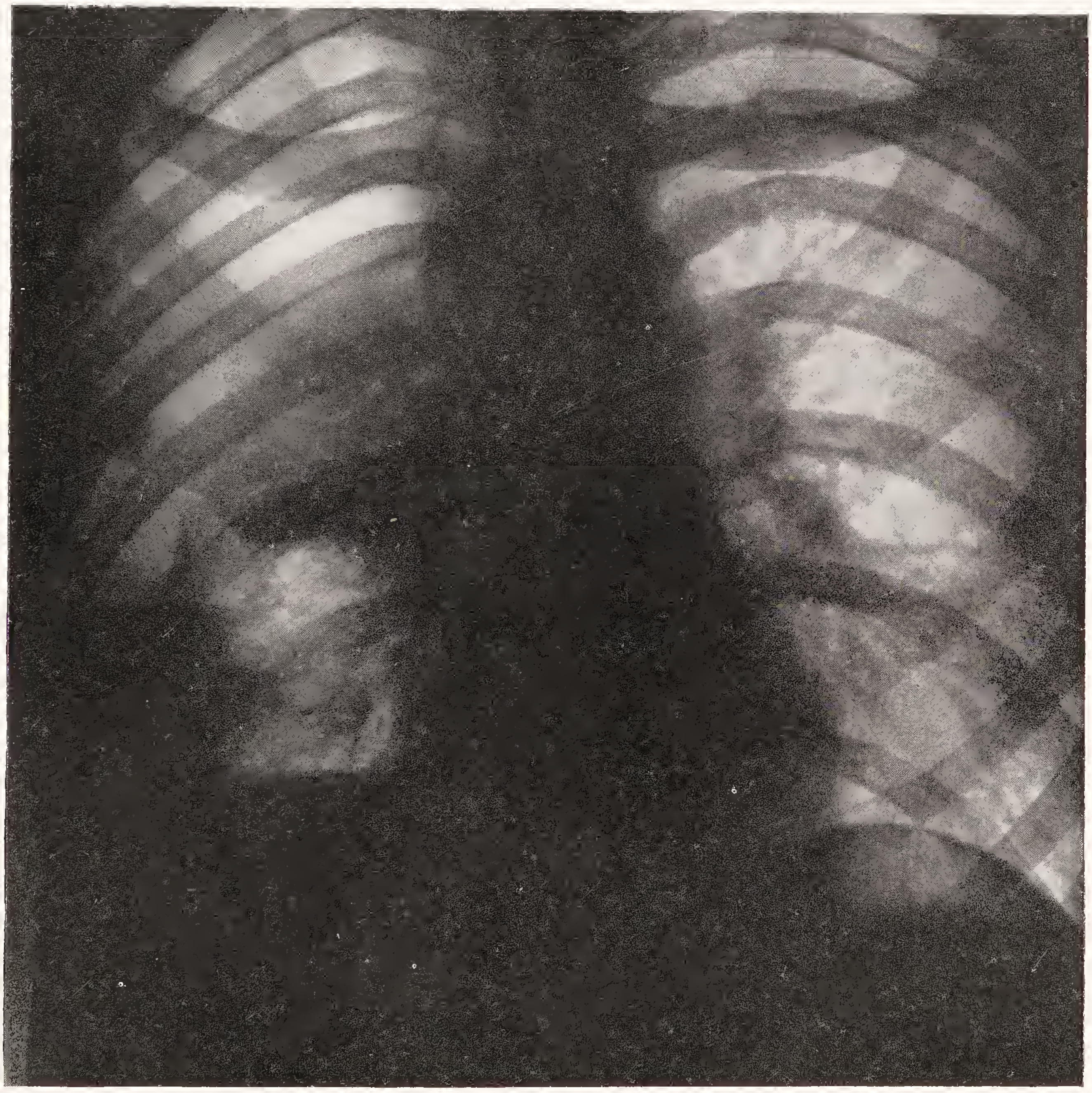
A.P.7(*a*).—Patient A.A., aged 30, male, sputum positive. Skiagram taken 2/6/30 shows development of pleural effusion (fluid in chest) on right side after induction of artificial pneumothorax.



A.P.7(*b*).—Same patient. Skiagram taken same day 2/6/30 after removal of 73 ozs. of fluid from right side of chest and replacement by air. Patient's condition in June, 1930, was very good; at home and fit for work as caretaker.

[*Skiagrams taken at Peel Hall Pulmonary Hospital.*]

SKIAGRAM ILLUSTRATING ARTIFICIAL PNEUMOTHORAX (CONTD.).



A.P.8.—Patient E.M., aged 17, male, sputum negative. After artificial pneumothorax had been induced an effusion appeared but the greater part disappeared spontaneously. The skiagram (taken 10/4/30) illustrates a collection of fluid at two levels due to the formation of adhesions. In June, 1930, the patient's condition was very good, he had put on weight, and was able to be up and about.

[*Skiagram taken at Peel Hall Pulmonary Hospital.*]

Thus, on a conservative estimate, 16 of the cases showed definite improvement (14 being either working and fit for work or up and on the high road towards restoration to health, and the other two improving but not yet afebrile); five cases showed either no improvement or were worse, relapse having followed a temporary improvement. This may be regarded as a very satisfactory result, bearing in mind the average age of the patients (31·8 years) and the type of case treated.

It would thus appear that in artificial pneumothorax we have a valuable adjunct to treatment in 10 to 15 per cent. of the hospital admissions, and that the benefit derived by carefully selected patients will amply compensate for the time and labour involved in the treatment.

Summary and Conclusions.

1. Artificial pneumothorax was attempted in 34 cases among 182 admissions to the Peel Hall Pulmonary Hospital between 1st January, 1929, and 31st May, 1930. A thirty-fifth patient, otherwise suitable, declined.

2. Of the 34 cases on which artificial pneumothorax was attempted, in seven dense adhesions rendered the attempts unsuccessful, and in six other cases the treatment was discontinued.

3. In 21 patients (representing 11 per cent. of hospital admissions), whose average age was 31·8 years and in whom satisfactory collapse was obtained, 16 showed definite and decided improvement, while five were not improved or became worse.

4. Artificial pneumothorax is a valuable addition to our methods of treatment.

5. Its employment is indicated in 10 to 15 per cent. of admissions to a pulmonary hospital.

6. It is especially useful in young adults—a type of case whose response to ordinary sanatorium treatment is frequently unsatisfactory.

The accompanying skiagrams illustrate the successful collapse of a diseased lung (A.P. 4 (*a*) and 4 (*b*)); bilateral pneumothorax (A.P. 5 (*a*) and 5 (*b*)); the presence of adhesions (A.P. 6 (*a*) and 6 (*b*)); the formation of fluid (effusion) during the course of treatment and its replacement by air (A.P. 7 (*a*), 7 (*b*) and 8). Adhesions and effusions form at times a serious obstacle to effective treatment, and may require surgical intervention, *viz.*, division of adhesions, phrenic evulsion, or even thoracoplasty.

The provision of facilities for these procedures, when indicated, must be regarded as inevitable in accordance with the best modern practice, wherever artificial pneumothorax is systematically undertaken.

REPORT BY DR. G. JESSEL ON THREE CASES OF SPONTANEOUS PNEUMOTHORAX.

Dr. Jessel has also contributed the following notes on three cases of spontaneous pneumothorax (that is, a collapse of the lung happening without any artificial interference) which occurred within a few weeks in Dispensary Area No. 4, and the associated Peel Hall Pulmonary Hospital. The cases illustrate the employment by a single officer of radiology, Lipiodol, and gas replacement.

(*a*) *Empyema, Perforation of Bronchus and Partial Pneumothorax.*

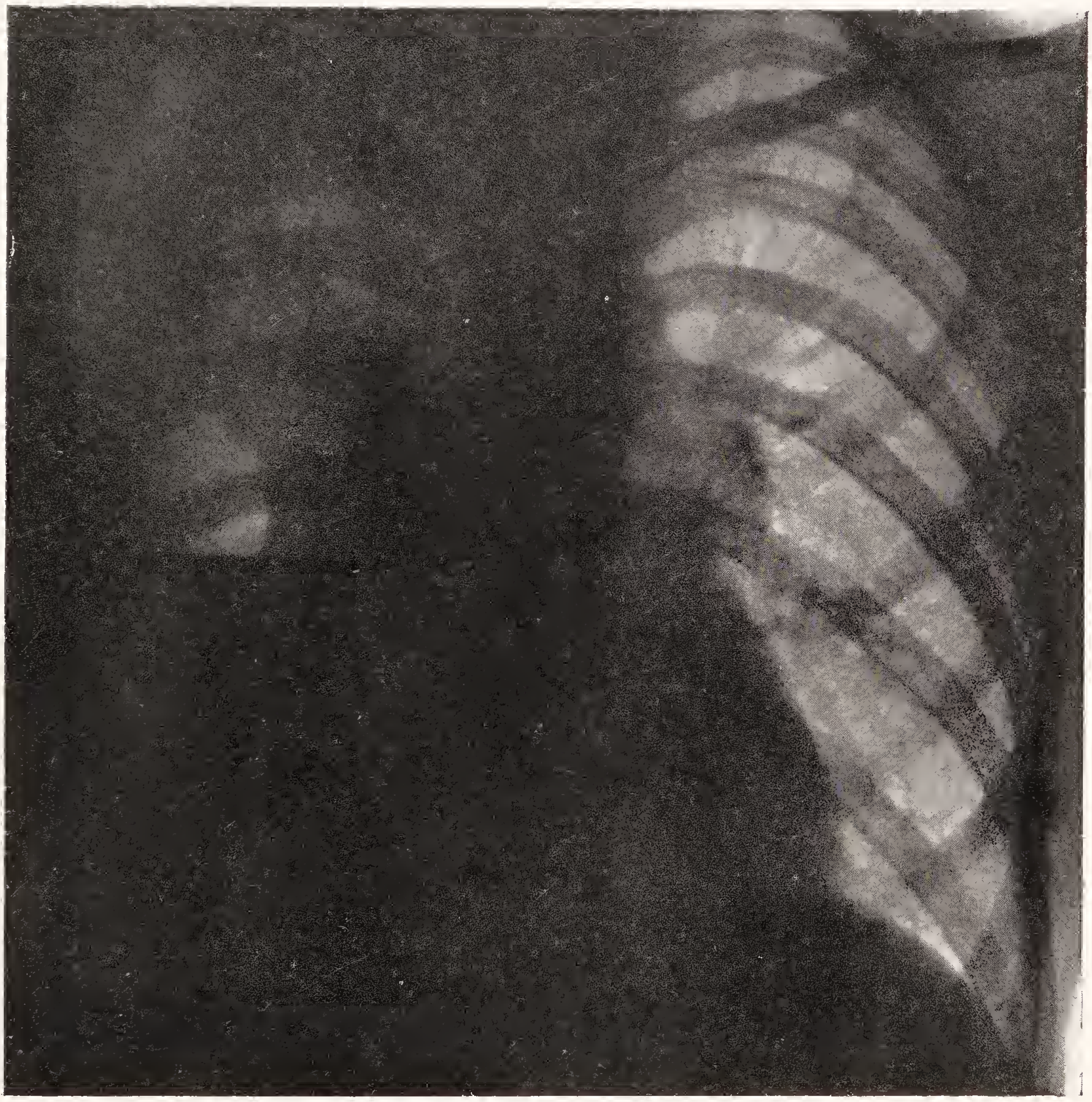
A few cases of this condition are recorded in medical literature, but apparently a skiagram of the condition has rarely been obtained. The following case is thus of interest.

Arthur L., aged 17, with a history of previous good health, was suddenly taken ill in February, 1929, with what appeared to be influenza. Subsequently pneumonia was diagnosed, but after several weeks his doctor referred him to the tuberculosis officer, through whom he was admitted on the 7th August to the Peel Hall Hospital for investigation. His weight then was 6st. 2lbs., evening temperature 99°, pulse 108. The expectoration was profuse. The right lung was dull on percussion, and the breath sounds weak with many crepitations in front ; tactile vocal fremitus was present, but no splash or coin sound was heard. Microscopical examination of the sputum showed no tubercle bacilli, but cocci arranged in chains were numerous. Subsequently Dr. Davey, of the Public Health Laboratory, Manchester, inoculated two animals and identified the organisms as hæmolytic streptococci. A skiagram (S.P. 1) showed a dense homogeneous opaque shadow with the upper margin horizontal at the level of the fourth rib in front, merging with the cardiac and diaphragm shadows. Above and to the outer side was a clear pocket bounded externally by the chest wall, and with its inner margin concave outwards midway between the chest wall and mediastinum. Above and to the inner side of the clear area was a shadow of moderate and uneven density extending to the apex of the lung. The heart was apparently not displaced. Gradually the sputum diminished in amount and the general condition improved, but on the 5th September he complained of headache and pain in the right side of the chest. Next day his temperature rose to 100.6° and he coughed up half a pint of thick pus. His temperature then fell to normal and he felt better. The physical signs at this time were : defective movement of the right side of the chest ; tactile vocal fremitus present all over ; percussion note dull, especially at the right base ; weak breath sounds and a few crepitations over the upper lobes, no breath sounds audible over the lower lobe. His condition greatly improved, and being a non-tuberculous case, he was discharged on the 26th September.

(*b*) *Bronchiectasis causing Spontaneous Pneumothorax.*

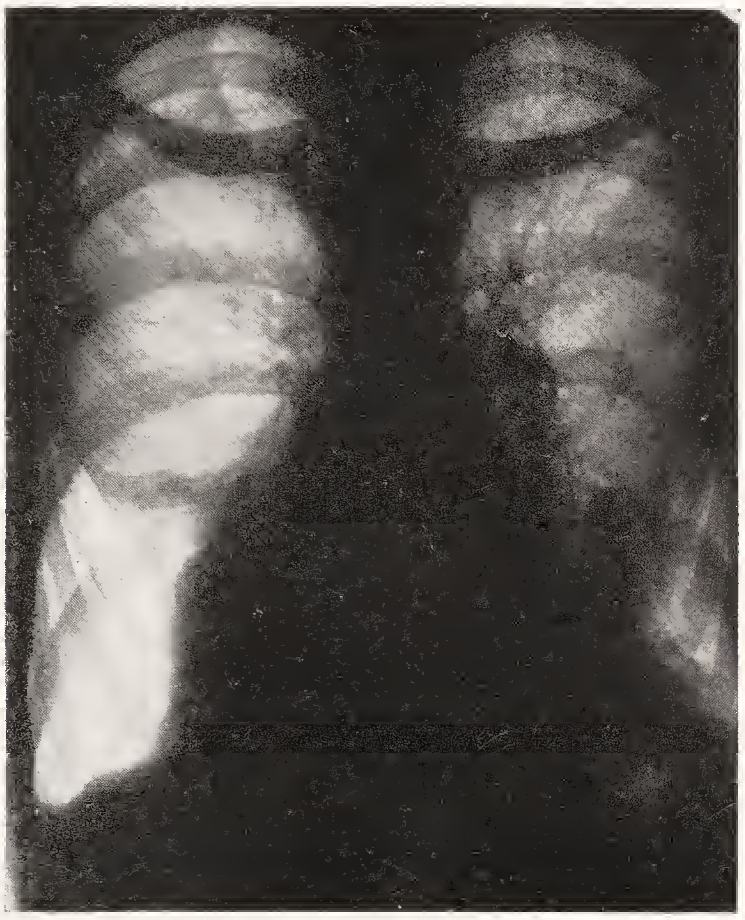
James P., aged 17, a grocer's assistant, was referred by his doctor to the tuberculosis officer on the 17th September, 1929, complaining chiefly of lack of energy for about a year. Other symptoms were cough, expectoration, night sweats, and loss of weight. Apart from an attack of rheumatism four years before, his previous health had been good. On examination his temperature was 100° and the fingers were clubbed. Outstanding physical signs were interscapular dullness on both sides, apparent hyperresonance of base of right lung with very poor air entry and no crepitations. Examination of the heart showed cardiac area enlarged,

SKIAGRAM ILLUSTRATING SPONTANEOUS PNEUMOTHORAX.

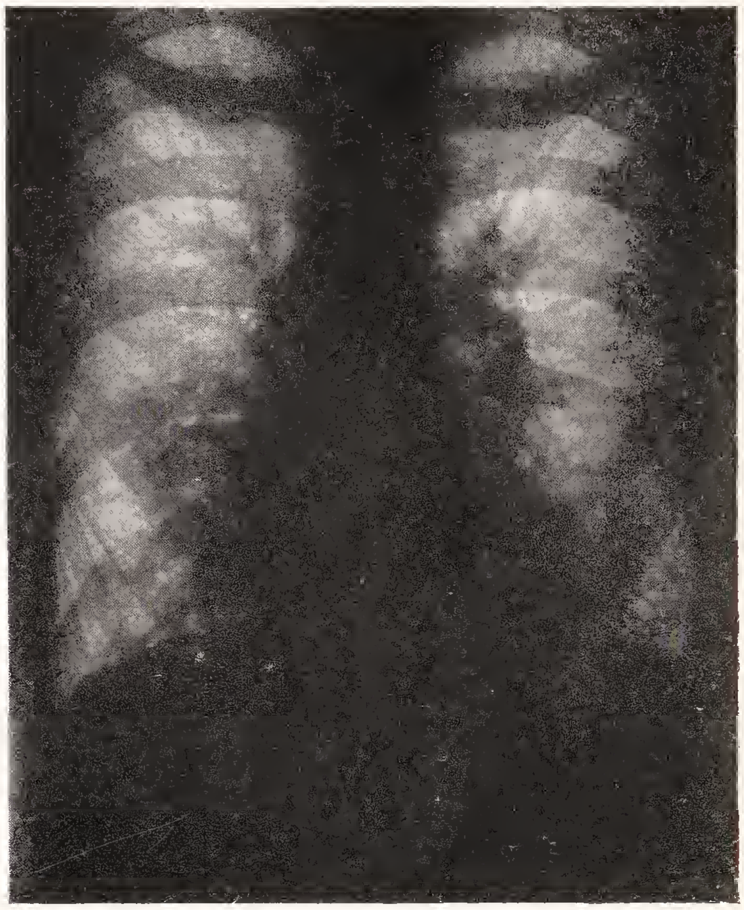


S.P.1.—Patient A.L., aged 17, male, sputum negative. Skiagram taken 7/8/29 illustrates spontaneous pneumothorax due to a perforation of a bronchus in empyema. Above the dark area which fills the right lower half of the picture is a small light pocket which represents an air-containing cavity.

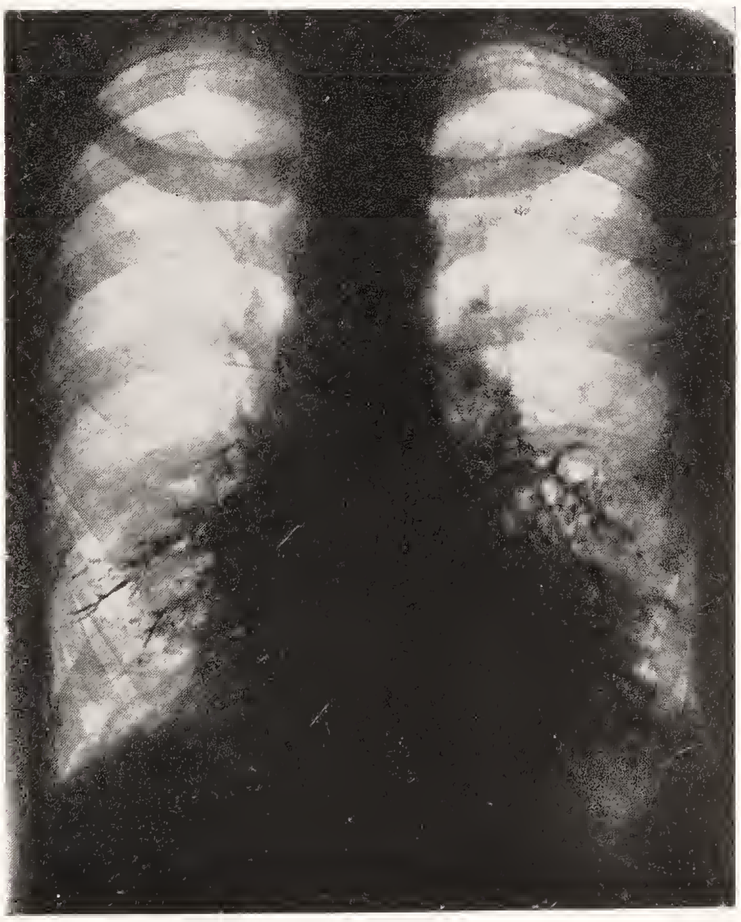
[*Skiagram taken at Peel Hall Pulmonary Hospital.*]



S.P.2(*a*).—Patient J.P., aged 17, male, sputum negative. Skiagram taken 17/9/29 at the Eccles Dispensary illustrates spontaneous pneumothorax in a case of bronchiectasis. At the right base is a large clear area which is an air-containing space.

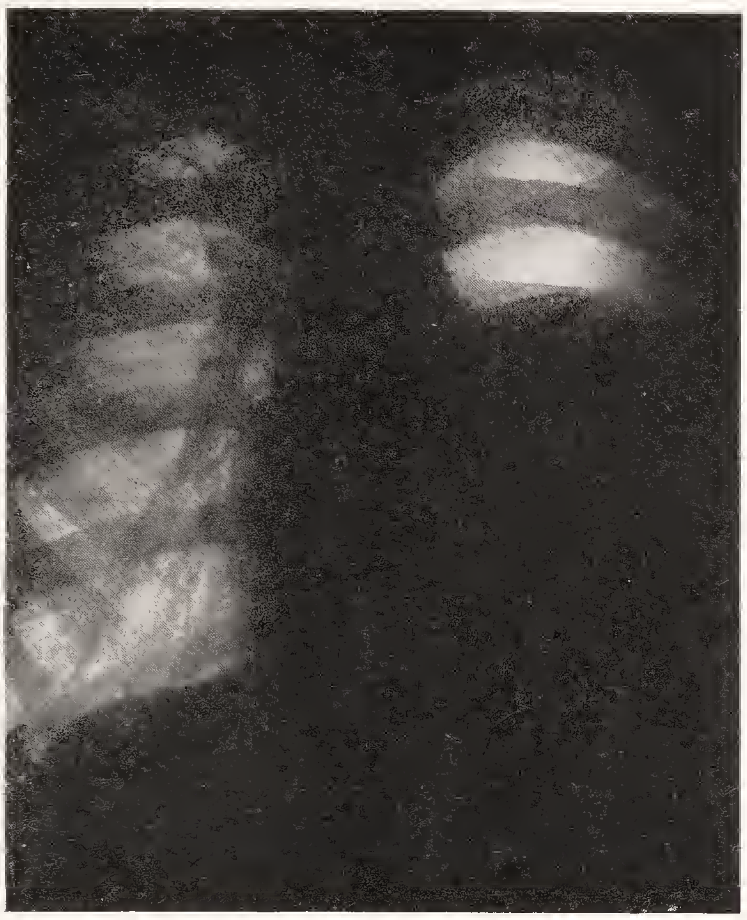


S.P.2(*b*).—Same patient. Skiagram taken 21/11/29 whilst patient was in Peel Hall Pulmonary Hospital; note the disappearance of the air pocket seen in preceding skiagram S.P.2(*a*).

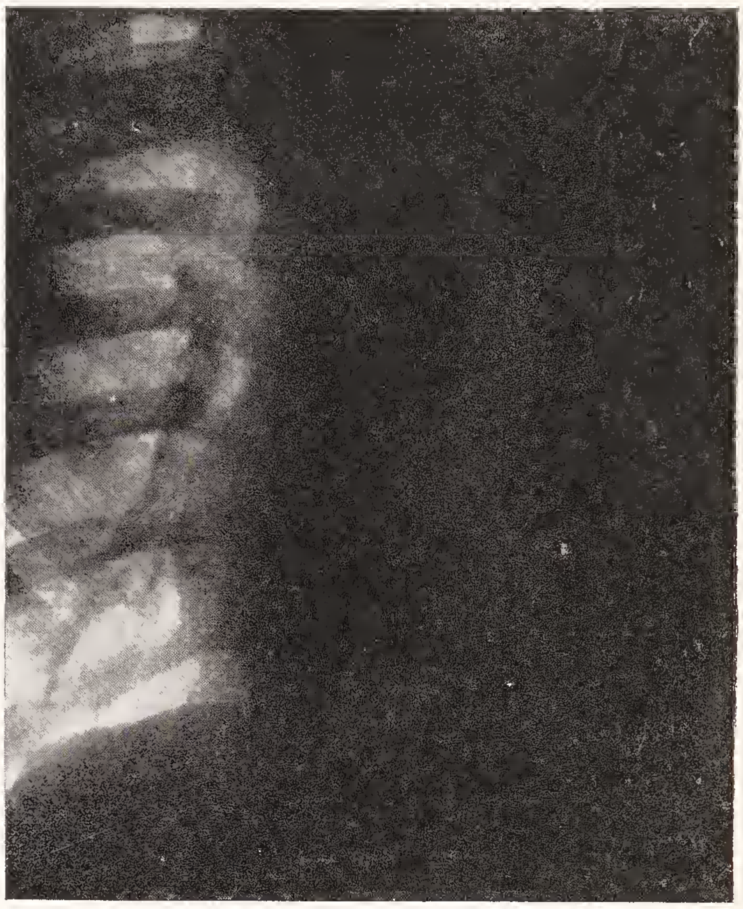


S.P.2(*c*).—Same patient. Skiagram taken 29/11/29 at Peel Hall after injection of Lipiodol; the dilated bronchi at the left base are visible as dark thickenings.

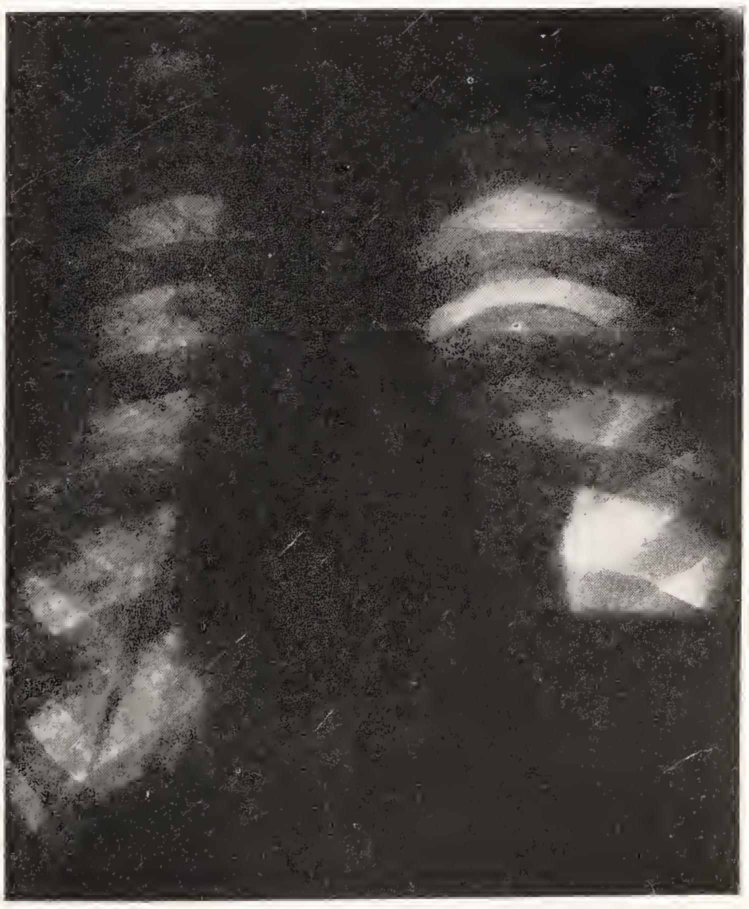
SKIAGRAMS ILLUSTRATING SPONTANEOUS PNEUMOTHORAX (CONTD.).



S.P.3(*a*).—Patient J.B., aged 19, male, sputum positive. Skiagram taken 26/8/29 illustrates a case of spontaneous pneumothorax due to pulmonary tuberculosis. Above the dark area, representing fluid, on the left side is a light area representing air space. The upper margin of the spontaneously collapsed lung is seen above the fluid level.



S.P.3(*b*).—Same patient. Skiagram taken 21/11/29 shows the whole of the left of the picture opaque owing to the presence of fluid (pleural effusion).



S.P.3(*c*).—Same patient. Skiagram taken 9/12/29 after gas (air) replacement. Most of the fluid has been replaced by air. The collapsed left lung can also be seen.

[*Skiagrams taken at Peel Hall Pulmonary Hospital.*]

wavy impulse with presystolic thrill and murmur. A skiagram (S.P. 2 (*a*)) taken at Eccles Dispensary showed enlargement of the cardiac area on both sides, with a large air space occupying what should have been the base of the right lung. There were prominent branchings especially towards the left base, but no mottling in the lung substance. He was admitted to the Peel Hall Hospital on the 17th October. His weight was 7st. 12 lbs. ; physical signs as above. His temperature became normal after the first day. The sputum was profuse and purulent, and twelve examinations failed to reveal tubercle bacilli. A skiagram (S.P. 2 (*b*)) was similar to the earlier one, but now showed no trace of the pneumothorax at the right base. Bronchiectasis was suspected, and, in order to establish a diagnosis, Lipiodol was injected through the crico-thyroid membrane. A skiagram (S.P. 2 (*c*)) taken immediately afterwards showed marked dilatation of the bronchi, particularly of the left lower lobe. He was discharged on the 18th November, having gained 13½lbs. in weight, and much improved in health.

(*c*) *Spontaneous Pneumothorax due to Tuberculosis.*

This condition is fairly common, and frequently has an acute onset with alarming symptoms of dyspnœa. The following case is of interest because the pneumothorax apparently occurred insidiously and was unsuspected. James B., aged 19, a piecer in a cotton mill took ill suddenly in March, 1929, with pain in the left side. Pleurisy was diagnosed and he was treated at a general hospital for eight weeks, his left side being tapped while there. Pulmonary tuberculosis having been diagnosed, he was admitted to the Peel Hall Hospital on the 28th August, 1929. His weight was 9st. 6¼lbs. ; temperature 98–99·2°. Physical examination showed diminished expansion of the left lung, tactile vocal fremitus slight, with dullness over the lower lobe and slight vocal resonance. Tubercle bacilli were present in the sputum. A skiagram (S.P. 3 (*a*)) showed evidence of fluid at the left base with collapse of the left lung and a quantity of air above the fluid. The effusion steadily increased replacing the air (skiagram S.P. 3 (*b*)), the whole of the left side presenting a homogeneous opacity in the skiagram taken on the 21st November. Gas replacement was then undertaken, 56 ounces of fluid being replaced by 1,500 c.c. of air, the final pressure being −8+8. The result is shown in skiagram S.P. 3 (*c*), the fluid being seen to be mostly replaced by air and the collapsed lung is shown. Gas replacement became necessary on two further occasions owing to the gradual reformation of the effusion. The temperature was unstable, at intervals reaching 100·6°, but settled with rest in bed, and on the whole the course was steadily towards improvement. On the 31st May he was up and about, having gained 11 lbs. in weight, and his general condition being good.

IV.—TREATMENT OF TUBERCULOSIS BY ARTIFICIAL LIGHT.

PRESENT POSITION OF THE COUNTY SCHEME.

Commencing with two experimental light centres in 1925, the County scheme has been extended, and the following table shows the twelve centres which have been opened at County tuberculosis dispensaries up to the end of 1929, together with the lamp equipment :—

TABLE 10.

Tuberculosis Dispensary.	Light Centre Opened.	Lamp equipment.
Lancaster	15/7/25	1 Carbon arc (" Sunrae "). 1 Kromayer mercury vapour. 1 Hanovia mercury vapour.
Ashton-under-Lyne	11/9/25	2 Carbon arcs (" Sunrae "). 1 Kromayer mercury vapour. 1 Jesionek mercury vapour. 1 Sollux (luminous heat rays).
Chorley	14/10/26	1 Carbon arc (" Alpine Sun "). 2 Jesionek mercury vapour. 1 Kromayer mercury vapour.
Preston	29/11/27	1 Carbon arc (" Alpine Sun "). 1 Tungsten arc. 1 Kromayer mercury vapour.
Eccles	1/12/27	2 Carbon arcs (" Sunrae "). 1 Kromayer mercury vapour. 1 Jesionek mercury vapour. 1 Murray-Levick infra-red.
Stacksteads	9/1/28	2 Jesionek mercury vapour. 1 Kromayer mercury vapour.
St. Helens	16/1/28	2 Carbon arcs (" Sunrae "). 1 Kromayer mercury vapour.
Ulverston	5/6/28	2 Carbon arcs (" Sunrae "). 1 Kromayer mercury vapour.
Fleetwood	25/6/28	2 Carbon arcs (" Sunrae "). 1 Kromayer mercury vapour.
Radcliffe	20/7/28	2 Carbon arcs (" Sunrae "). 1 Kromayer mercury vapour. 1 Jesionek mercury vapour. 1 Sollux (luminous heat rays).
Nelson	20/11/28	2 Carbon arcs (" Sunrae "). 1 Kromayer mercury vapour. 1 Jesionek mercury vapour.
Wigan	31/5/29	2 Carbon arcs ("Sunrae"). 1 Kromayer mercury vapour. 1 Jesionek mercury vapour.

The treatment of the patients has been carried out under the direct supervision of the consultant tuberculosis officer of each dispensary area and the medical and nursing staff under him. For the extra work thrown on the staff throughout the County area, one additional assistant tuberculosis officer and three additional tuberculosis health visitors have been appointed.

The tuberculosis medical staff have had facilities given them by the County Council to specialise in light therapy, the experimental work lasting for two years before the scheme was applied over the whole Administrative area.

RESULTS OF TREATMENT.

Tables showing the results of treatment at each light centre have been received from the consultant tuberculosis officers of the dispensary areas, and are included in Chapters X. to XVI. The tables in question have been summarised in the following form which represents the work done at the twelve centres in the County during the year 1929 :—

TABLE 11.

Form of tuberculosis or part of body affected.	Number of cases on treatment on 1-1-29	Number of cases commencing treatment in 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
			Quiescent and apparently cured.§	Improved.	Stationary	Worse.		
Skin (lupus and scrofulo-derma)	167	109	60	12	2	1	35	166
Adenitis with abscess formation and skin involvement ...	87	133	87	6	—	—	21	106
Adenitis without softening ...	57	99	55	9	3	—	31	58
Bones, joints, and spine ...	56	41	26	5	5	—	24	37
Abdomen	12	30	13	1	2	1	6	19
Other non-pulmonary conditions	17	12	10	1	1	—	4	13
Pulmonary tuberculosis :—								
Lungs—sputum positive ...	1	3	—	—	1	—	—	3
sputum negative ...	—	2	—	—	—	—	—	2
Bronchial glands	—	4	—	—	—	—	2	2
Pleura	1	1	—	—	—	—	—	2
Pulmonary and non-pulmonary combined	5	5	1	—	—	1	6	2
Total for 1929	403 842 †	439	252	34	14	3	129	410
For comparison, the total in 1928 was	153 726 ‡	573	190	23	10	1	99	403

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* Includes : (1) any patient who did not receive two months' treatment ; (2) patients ceasing light treatment prematurely (*e.g.*, removals, unwilling or unable to continue) ; and (3) patients transferred to sanatoria or hospitals.

† Adults, 466 ; children, 376. ‡ Adults 419 ; children, 307.

§ The term "quiescent and apparently cured" has been chosen to express the condition of a lesion which has been healed by artificial light treatment. By direction of the Ministry of Health no case of non-pulmonary tuberculosis is written off the tuberculosis register as "cured" until three years have elapsed without any signs or symptoms of active disease.

In addition to the 842 active cases dealt with in the foregoing table, there were 72 cases—70 non-pulmonary and 2 pulmonary—whose condition was quiescent on commencing light treatment. The object of treatment was to prevent a possible recurrence of active disease.

The results of treatment of cases of non-pulmonary tuberculosis in 1929 may be considered satisfactory, particularly for two groups of cases, namely: (i) skin (lupus and scrofulo-derma), and (ii) adenitis with abscess formation and skin involvement. These two conditions are usually refractory to other forms of treatment.

Of the total patients attending the light centres, 77 per cent. were able to continue their normal occupation during the course of treatment.

The average gain in weight of the 252 patients who became " quiescent and apparently cured " was as follows :—adults 3·24 lbs. ; children 5·02 lbs.

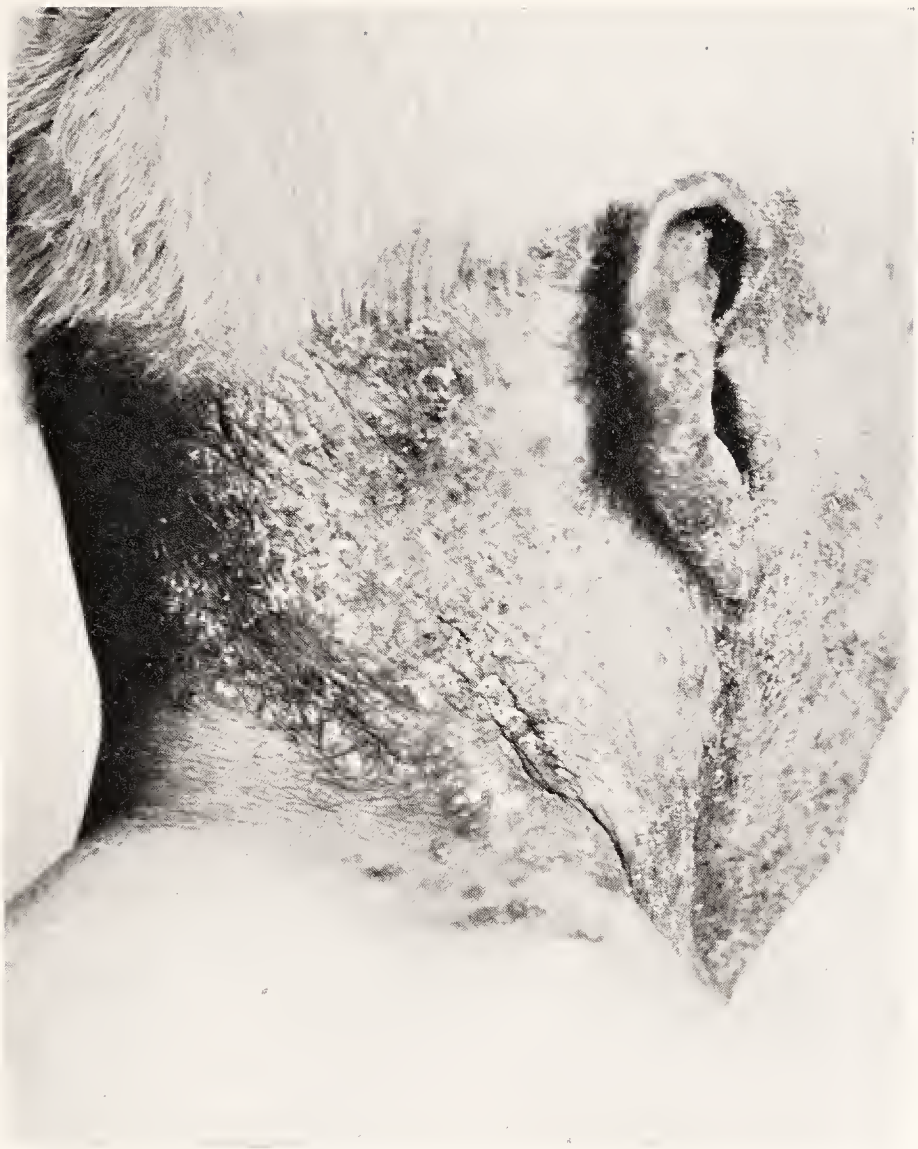
The degree of pigmentation attained in these 252 patients was : deep 56, medium 67, light 69, none 60.

AVERAGE DURATION OF TREATMENT.

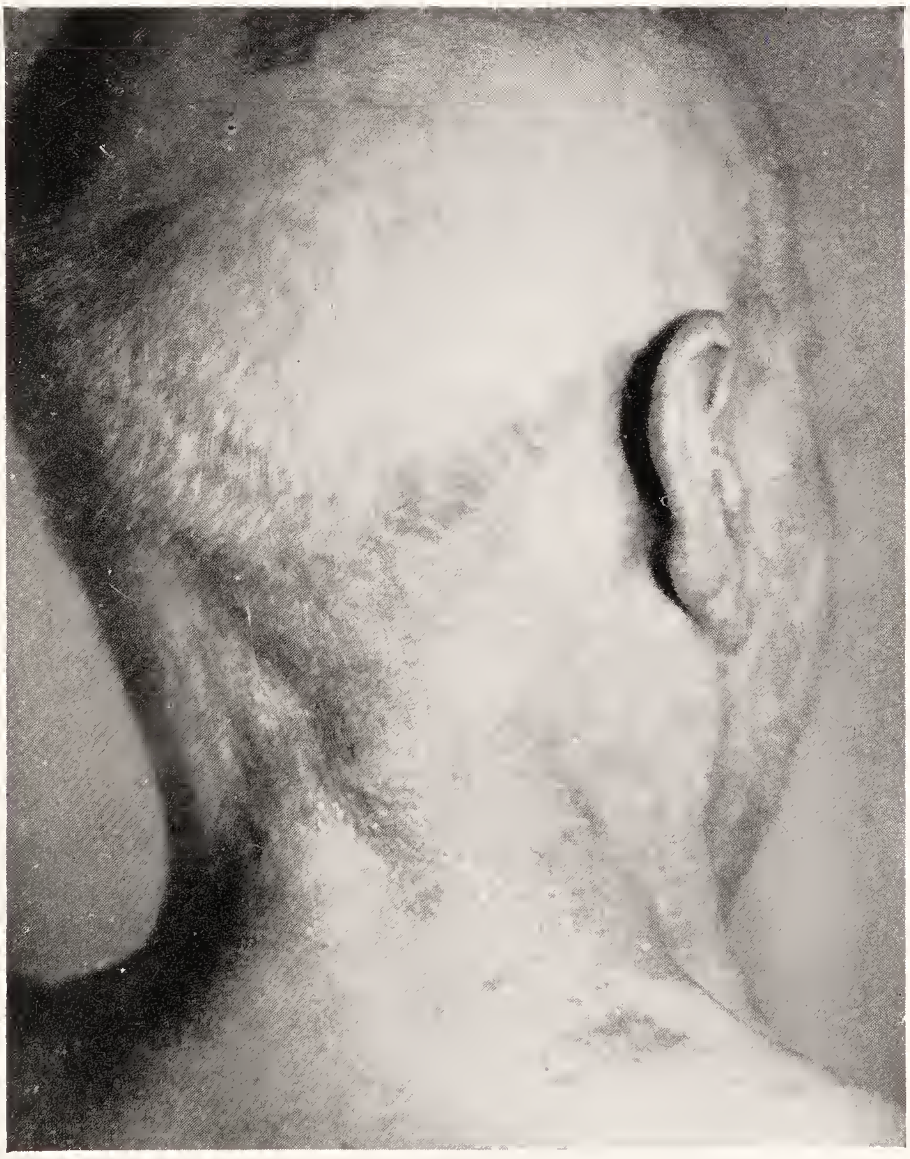
The duration of treatment has varied widely according to the type of non-pulmonary disease. Taking the several groups of cases in which the disease has become " quiescent and apparently cured " the average duration is as given in the following Table 12 :—

Form of tuberculosis or part of body affected.	Number of cases (active on commencing light treatment) who became " quiescent and apparently cured."	Average duration of light treatment.	*For comparison* : Average duration of disease *before* commencing light treatment.
		Months.	Months.
Skin (lupus and scrofulo-derma)	60	10·35	128·03
Adenitis with abscess formation and skin involvement ...	87	7·73	34·32
Adenitis without softening ...	55	7·68	29·00
Bones, joints, and spine ...	26	12·18	58·92
Abdomen...	13	9·75	11·30
Other non-pulmonary conditions	10	10·30	32·90
*T.B. plus and adenitis with abscess formation	1	4·00	10·00
Total for 1929	252	8·99	56·67
For comparison, the total in 1928 was	190	6·46	56·40

* Local treatment only for non-pulmonary condition.

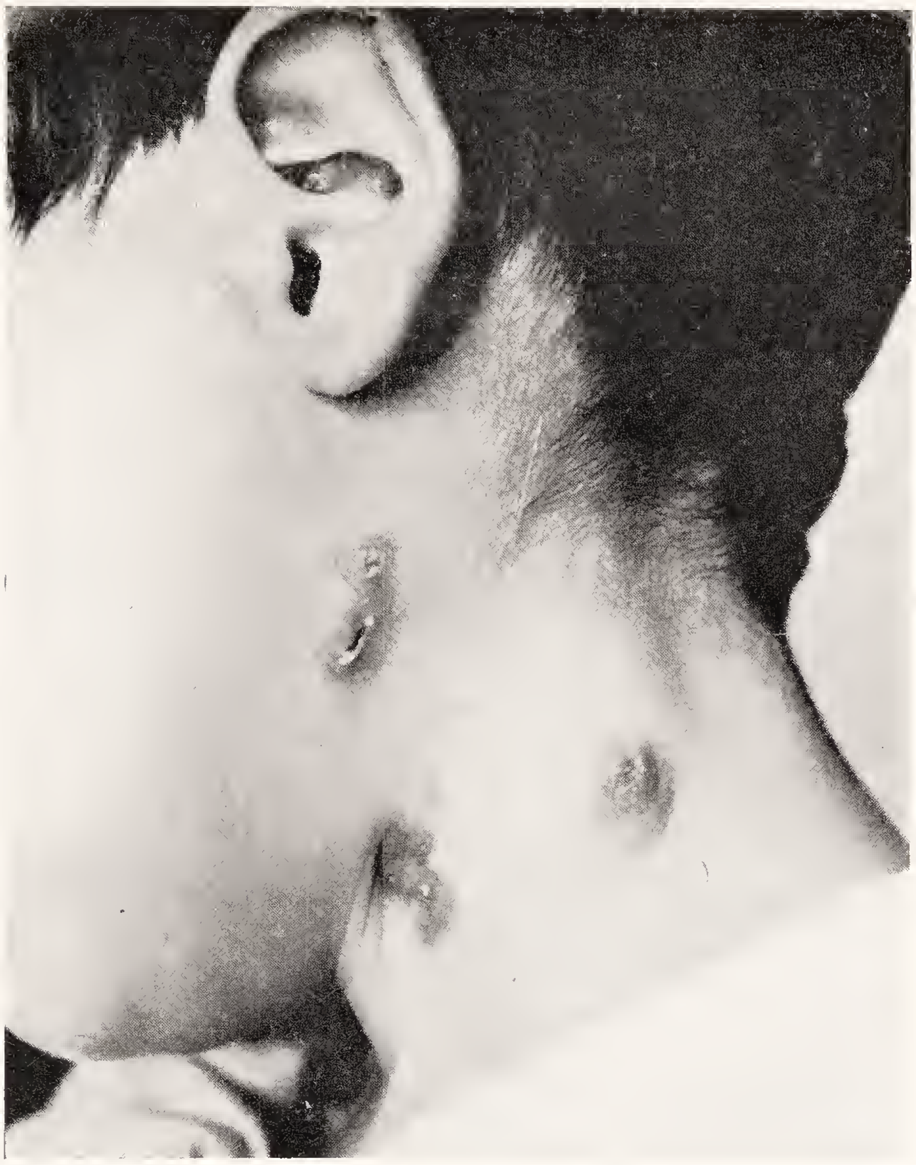


No. 1 (*a*). Patient J.M., aged 75 years. Extensive virgin lupus of 19 years' duration. Previous treatment, nil. Photograph shows condition on 27th May, 1929.

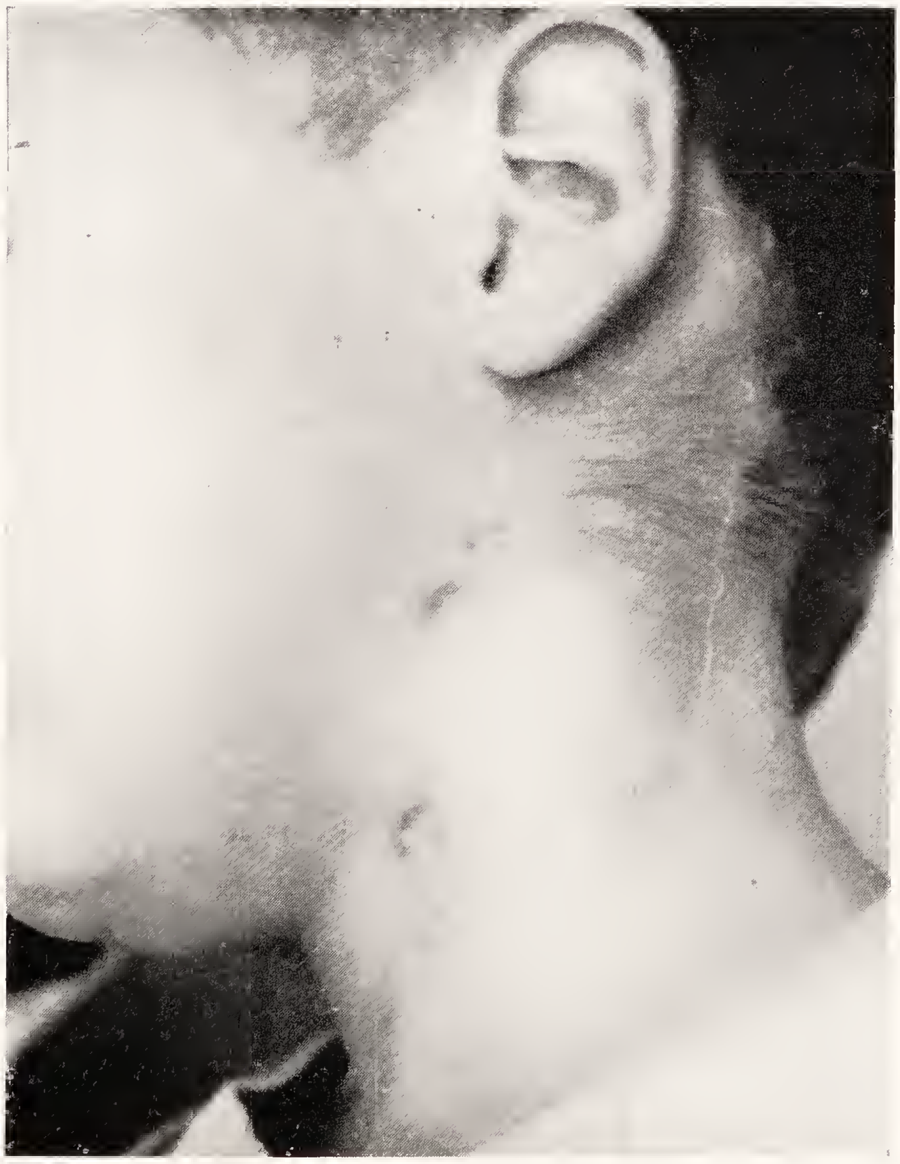


No. 1 (*b*). Same patient. Condition on 24th October, 1929, after five months' general light treatment. Patient did exceptionally well, but subsequently found difficulty in attending the dispensary regularly. Still under treatment.

[*Photographs taken at Fleetwood Dispensary.*]

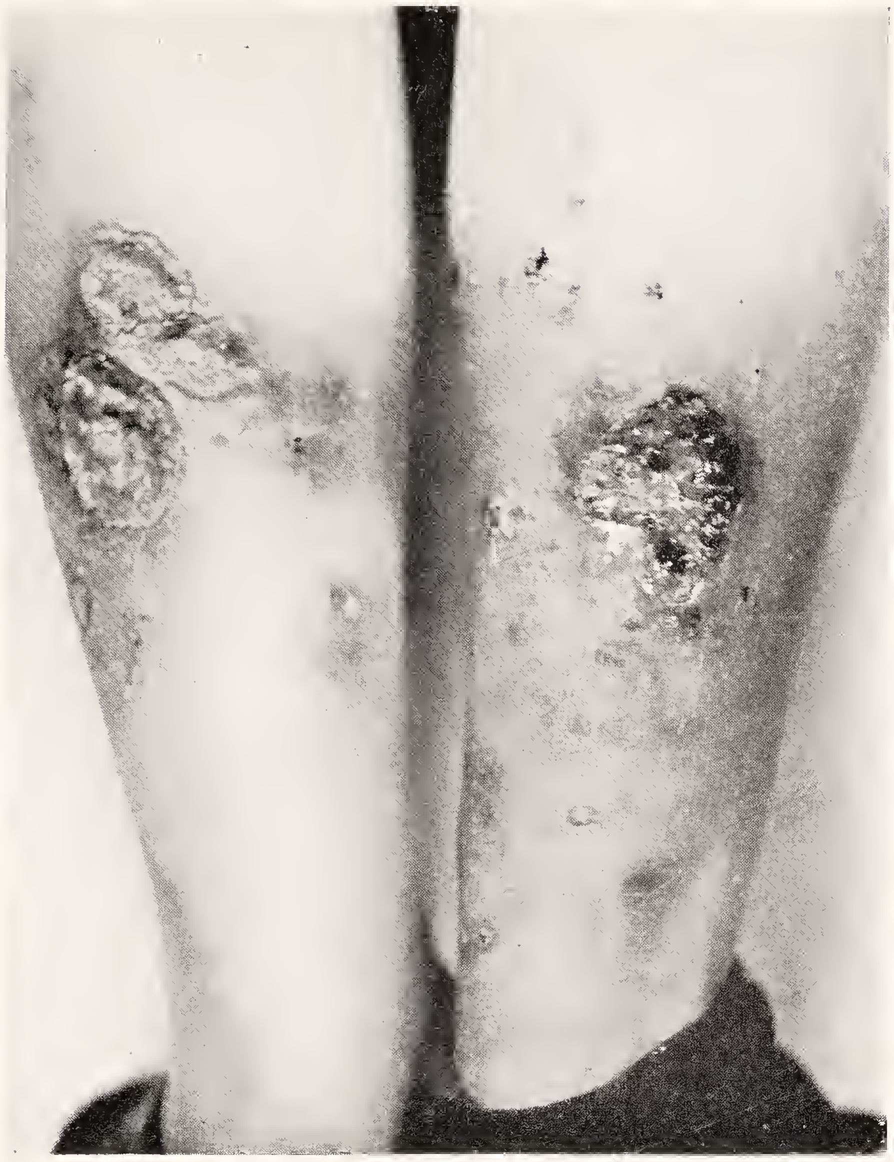


No. 2 (*a*). Patient E.R., aged 3. Multiple gland infection with caseous discharge and skin involvement. Duration of disease 6 months. Previous treatment, nil. Photograph shows condition on 13th August, 1929—the skin around the lesions is puckered.

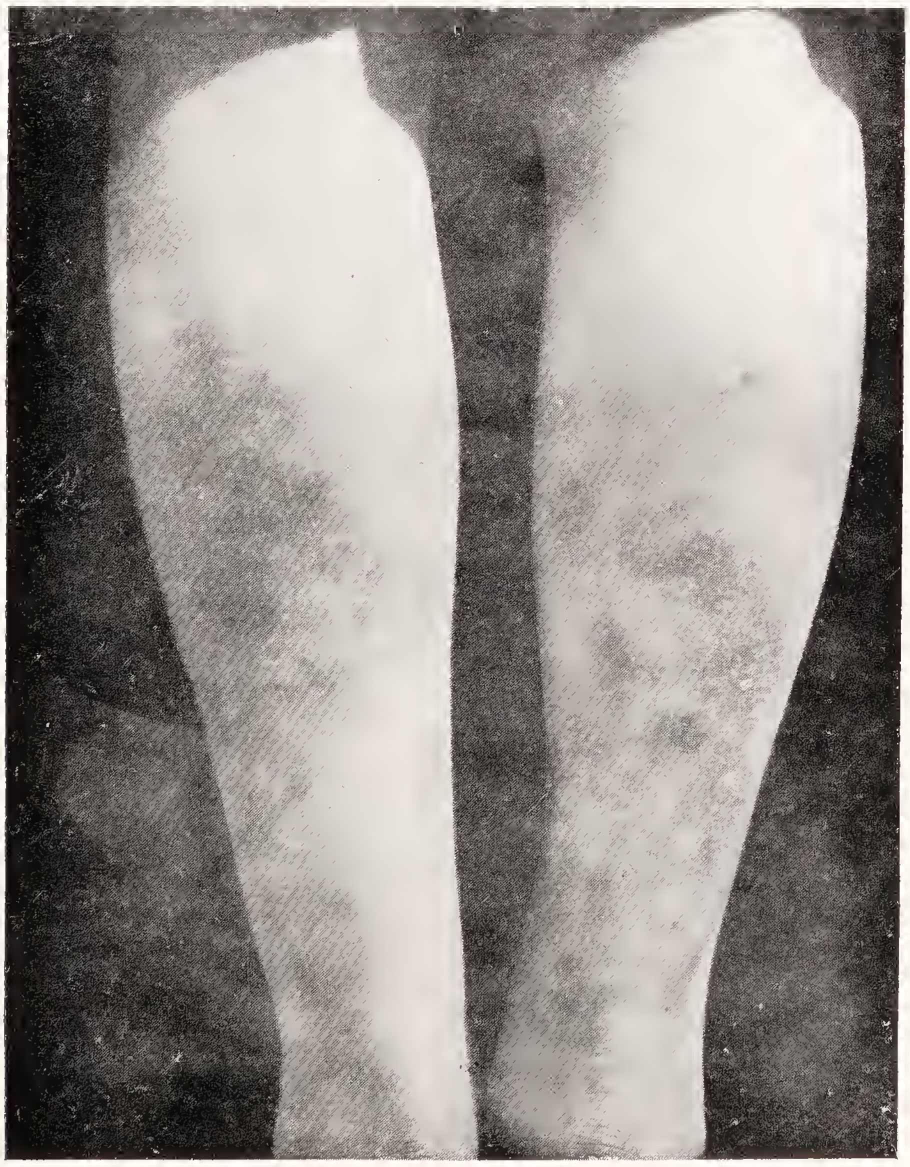


No. 2 (*b*). Same patient. Condition on 12th January, 1930, shows the lesions soundly healed and the puckering gone.

[*Photographs taken at Wigan County Dispensary.*]

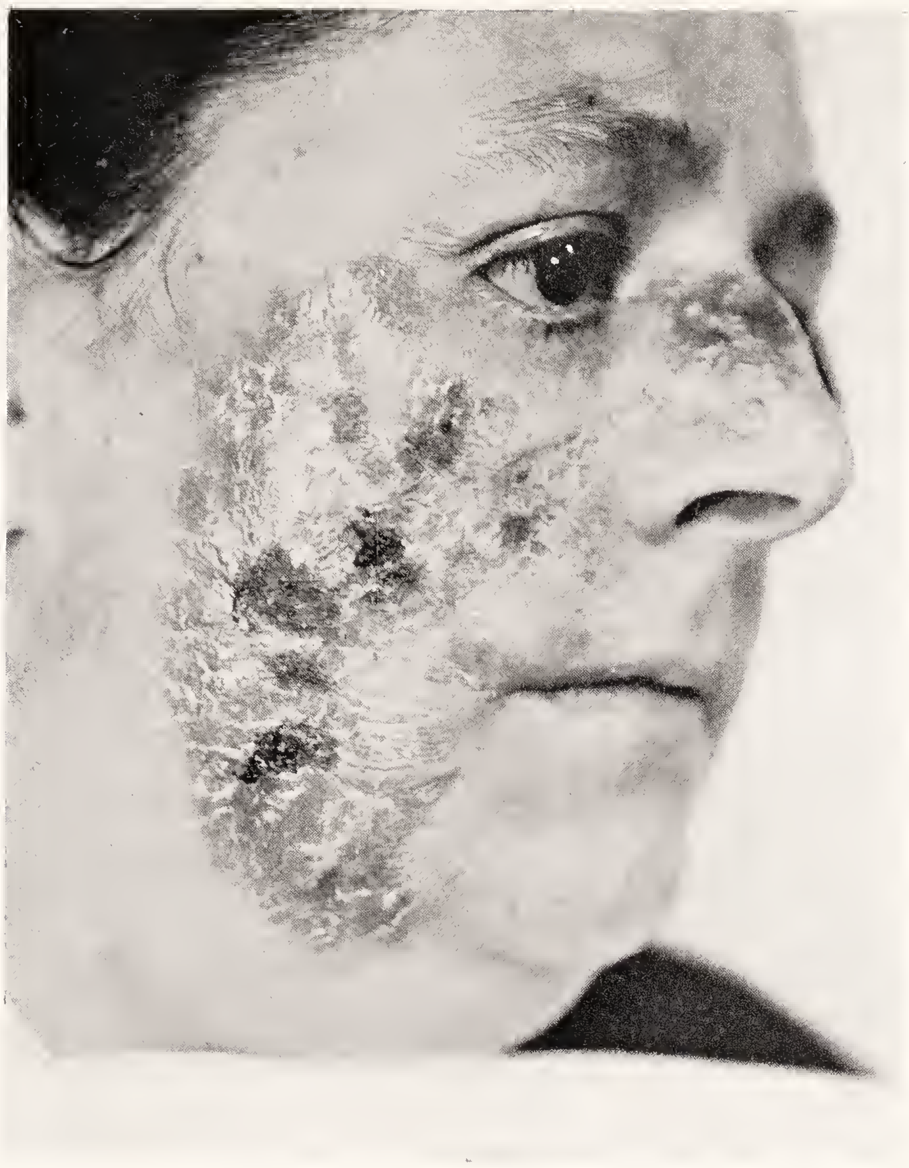


No. 3 (*a*). Patient H.P., aged 19. Bazin's disease. Duration of disease before light treatment commenced, 15 months. Previous treatment, 9 weeks in a special hospital. Condition in June, 1928. Patient unable to work.

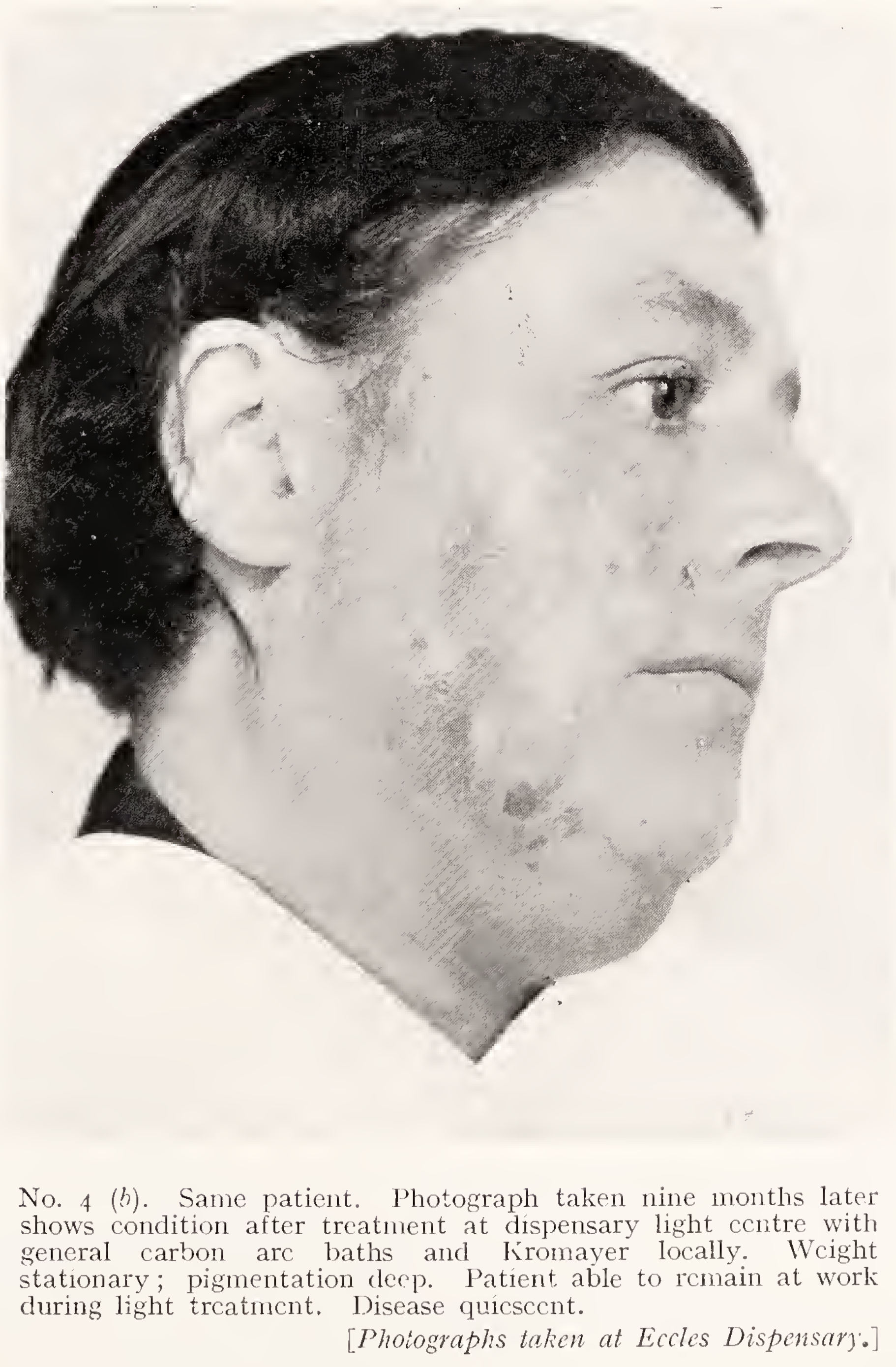


No. 3 (*b*). Same patient. Condition after 6 months' treatment at dispensary light centre with general carbon arc baths. Light treatment ceased March, 1929. Patient lost 10 lbs. in weight; now able to work.

[*Photographs taken at Ashton-under-Lyne Dispensary.*]



No. 4 (*a*). Patient M.W., aged 42. Lupus. Duration of disease before light treatment commenced at dispensary, 33 years. Treated at a special hospital for 12 years (from 1899 to 1911), had Finsen light and "snow" treatment. No treatment for last 18 years. Photograph shows condition on 10th May, 1929.



No. 4 (*b*). Same patient. Photograph taken nine months later shows condition after treatment at dispensary light centre with general carbon arc baths and Kromayer locally. Weight stationary; pigmentation deep. Patient able to remain at work during light treatment. Disease quiescent.

[*Photographs taken at Eccles Dispensary.*]

The frequency of attendance of patients depends on several factors, but at ten of the centres the great majority of patients attend twice per week, and at the other centres thrice per week. Thirty per cent. of the patients were assisted by the payment of railway, bus or tram fares to the light centre.

PHOTOGRAPHIC RECORDS.

In order to record the progress made by patients, photographs have been taken of a number of cases treated by light—at commencement, during the course of treatment, and on termination.

Here inserted are photographs of four patients which have been selected as illustrating the effect of light treatment. The upper photograph shows the condition prior to commencing light treatment, and the lower photograph the appearance of the affected part on or towards the conclusion of treatment.

COST OF LIGHT TREATMENT.

The following statement shows the cost of artificial light treatment at the centres :—

Average number of patients under treatment in any one week ...	422	
Average cost per patient per week :—	s.	d.
Carbons and current	0	5
Standing charges (*including proportion of time of tuberculosis officers, tuberculosis health visitors, fuel, light, cleaning, rent, rates, renewals, repairs, and depreciation*)	4	1½
Total	4	6½

The cost of light treatment should, however, be considered in conjunction with other forms of treatment which otherwise some of the patients would in all probability have received. Taking the 252 cases which have become quiescent after treatment at the light centres, 106 of the cases would have been recommended for admission to special or general hospitals, and 105 for out-patient treatment at the Manchester and Salford Skin Hospital if light treatment had not been available.

Knowing the average duration of institutional treatment for such cases and the cost, one can make a comparison between the expense involved in light treatment for these 252 patients and ordinary institutional treatment :—

Actual complete cost of 252 patients cured by light treatment at County dispensaries :—	Estimated cost of residential and out-patient treatment if patients had been sent to hospitals :—
£2,244	£4,792

Thus, apart from other considerations, a very considerable financial saving—£2,548—has been effected on the treatment of these 252 patients.

Related to the opening of the light centres is the diminution in the number of cases who have to travel from all parts of the County to the Manchester and Salford Skin Hospital out-patient department:—

Dec. 31, 1924—	Number of patients attending Skin Hospital ...	284
Do. 1929—	do. do. ...	38

Summary.

1.—Artificial light treatment, undertaken at dispensaries by the tuberculosis officers and tuberculosis health visitors, has continued to give satisfactory results, particularly in regard to patients suffering from tuberculosis of the skin, and tuberculous adenitis with abscess formation and skin involvement, which conditions are very slow in yielding to other forms of treatment.

2.—Of the total patients attending light centres, 77 per cent. were able to continue their normal occupation during the course of treatment.

3.—Thirty per cent. of the patients treated during the year were assisted by the payment of their railway, bus, or tram fares to the dispensary light centres.

4.—In regard to the 60 skin cases which became "quiescent and apparently cured," the average duration of the disease before the patients commenced light treatment was 10 years 8 months, whereas the average duration of light treatment was 10⅓ months.

5.—For the 252 cases which became "quiescent and apparently cured," the average duration of the disease before the patients commenced light treatment was 4 years 8 months, whereas the average duration of light treatment was 9 months.

6.—The average cost of artificial light treatment at the 12 centres amounted to 4s. 6½d. per patient per week.

7.—Of the 252 cases concluding treatment in 1929 on becoming "quiescent and apparently cured," the consultant tuberculosis officers would normally have recommended 211 for treatment at hospitals. Based on the average duration of treatment of such cases, the cost would have been not less than £4,792, whereas their treatment at the dispensary light centres actually cost (all inclusive) £2,244—a saving of £2,548.

V.—TREATMENT OF NON-PULMONARY TUBERCULOSIS.

IMMEDIATE RESULTS OF INSTITUTIONAL TREATMENT AT GENERAL AND SPECIAL HOSPITALS.

A summary of the condition on discharge of patients treated during 1929 in approved general and special hospitals and in the Manchester and Salford Skin Hospital is given below :—

TABLE 13.

Classification on admission to the Institution.	Condition at time of discharge.	Duration of Residential Treatment in the Institution.												TOTAL	
		Under 3 months.			3—6 months			6—12 months			More than 12 months				
		M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	No.	%
Bones and Joints.	Quiescent	3	2	6	—	—	7	1	—	7	1	—	18	45	22·1
	Improved	17	24	11	9	9	8	7	2	3	14	6	12	122	60·1
	No material improvement ...	6	6	5	2	1	—	2	1	1	—	1	2	27	13·3
	Died in Institution	2	2	3	—	—	—	1	—	1	—	—	—	9	4·4
Abdominal.	Quiescent	—	4	—	1	1	3	—	—	3	1	2	2	17	29·8
	Improved	6	7	5	—	—	2	1	—	—	—	—	1	22	38·6
	No material improvement ...	1	2	4	2	—	1	1	—	—	—	—	1	12	21·0
	Died in Institution	1	—	5	—	—	—	—	—	—	—	—	—	6	10·5
Other Organs.	Quiescent	—	—	—	—	—	—	—	1	1	—	—	—	2	5·9
	Improved	14	12	—	—	1	—	—	—	—	—	—	—	27	79·4
	No material improvement ...	3	1	—	—	—	—	—	—	—	—	—	—	4	11·8
	Died in Institution	—	—	1	—	—	—	—	—	—	—	—	—	1	2·9
Peripheral Glands.	Quiescent	5	10	7	—	—	1	1	—	2	—	—	2	28	26·7
	Improved	16	25	25	—	2	—	1	—	1	—	—	1	71	67·6
	No material improvement ...	—	2	2	—	—	—	—	—	—	—	—	1	5	4·8
	Died in Institution	1	—	—	—	—	—	—	—	—	—	—	—	1	0·9
	Total	75	97	74	14	14	22	15	4	19	16	9	40	399	—
		Under 1 week.			1—2 weeks.			2—4 weeks.			More than 4 weeks.				
Observation for purpose of diagnosis.	Tuberculous	1	1	—	—	—	1	—	2	3	5	2	5	20	62·5
	Non-tuberculous	—	1	—	—	1	—	1	1	2	—	2	—	8	25·0
	Doubtful	—	—	—	—	—	1	—	—	—	—	—	2	3	9·4
	Died *	—	—	—	—	—	—	1	—	—	—	—	—	1	3·1

* The diagnosis in this case was pelvic cellulitis following diverticulitis.

AFTER-HISTORIES OF PATIENTS SUFFERING FROM NON-PULMONARY TUBERCULOSIS.

Table 14 below shows the after-histories of non-pulmonary cases (adults and children) who came on the dispensary register during the five years 1920 to 1924 :—

Classification : Part affected.	Adults or Children (at time of commencing treatment).	Net Number of Cases. *	Position at the end of 1929.							
			Cured.		Arrested or Quiescent.		Disease Active.		Died from Tub.	
			No.	%	No.	%	No.	%	No.	%
Bones and Joints...	Adults	428	159	37·1	80	18·7	54	12·6	135	31·5
	Children	441	199	45·1	122	27·7	56	12·7	64	14·5
Abdominal ...	Adults	99	40	40·4	12	12·1	1	1·0	46	46·5
	Children	209	118	56·4	20	9·6	2	0·9	69	33·0
Other Organs ...	Adults	59	30	50·8	9	15·2	5	8·5	15	25·4
	Children	11	3	27·3	2	18·2	2	18·2	4	36·3
Peripheral Glands	Adults	414	318	76·8	69	16·7	13	3·1	14	3·4
	Children	688	540	78·5	107	15·5	25	3·6	16	2·3
Skin	Adults	159	57	35·8	40	25·1	56	35·2	6	3·8
	Children	106	49	46·2	22	20·7	35	33·0	—	—
TOTAL ...	Adults	1159	604	52·1	210	18·1	129	11·1	216	18·6
	Children	1455	909	62·5	273	18·8	120	8·2	153	10·5

* Net number arrived at after deducting patients left County, untraced, ceased treatment for other than medical reasons, died from other than tuberculosis, and transferred to pulmonary.

The table shows the excellent results which have been, and are being, achieved in the treatment by modern methods of patients —particularly children—suffering from non-pulmonary tuberculosis. With regard to tuberculosis of the skin, however, it will be seen that between 30 and 35 per cent. of the patients were, at the end of 1929, suffering from the disease in an active form. Most of these cases are now treated by artificial light at centres established since 1926 at tuberculosis dispensaries. This form of treatment has proved much more successful than other methods, but sufficient time has not yet elapsed for these good results to reflect themselves in the table. No case is written off the register as " cured " until it has remained without signs or symptoms of active disease for at least three years.

It has been considered unsound to attempt to make any comparison between the results of treatment of patients at institutions as against treatment at home, because as a rule the worst cases have to be sent to residential institutions as they cannot be properly treated at home, and conversely the less severe types of cases (such as cervical glands and early disease of bones and joints) can be and are treated at home by their own doctor with the assistance of the dispensary staff.

VI.—EXAMINATION OF HOUSE CONTACTS.

By the systematic examination of house contacts, particularly among those of patients with positive sputum, many early or unsuspected cases of tuberculosis are detected. Owing to indifference or unwillingness, considerable difficulty—which, however, is gradually being overcome—is experienced in persuading contacts to come to the dispensary for examination, or even to submit themselves for examination at all.

By direction of the Ministry of Health (Memo. 121/T) cases are regarded as contacts only if the cause of their being examined is the fact that they have recently been, or still are, living in contact with some dispensary patient or other notified case ; many persons suffering, or suspected to be suffering, from tuberculosis who attend at the dispensary of their own accord, or who are referred by a private medical practitioner, may give a history of previous contact with a known case of tuberculosis, but this does not bring them within the definition of " contacts."

The following Table 15 shows the number of new contacts which have been examined in the Administrative County during 1929 :—

	Diagnosed as Tuberculous.		Doubtful. *	Non-Tuberculous.	Total.
	Pulmonary.	Non-pulmonary.			
Examined at Home ...	6	2	5	223	236
Examined at Dispensary	29	9	31	809	878
Total	35	11	36	1032	1114
	46				

*In the 36 doubtful cases the diagnosis of tuberculosis had not been made within one month of the first examination, and they are so classified as doubtful in accordance with the Ministry's Memo. 37/T.

Of the 1,114 new contacts examined during the year, 46 were ultimately diagnosed as definite cases of tuberculosis—pulmonary 35, and non-pulmonary 11. These cases are equal to 41·29 per 1,000 of contacts examined, as against the proportion of 4·58 tuberculous persons per 1,000 of the population known to the dispensary staff in the County. Thus, the examination of selected contacts revealed many more tuberculous cases proportionately than would be found in the ordinary population.

It may be stated that of the 35 pulmonary cases, 37 per cent. were found with a positive sputum.

Dr. G. Jessel, the consultant tuberculosis officer for Dispensary Area No. 4, has contributed the following report on the examination of tuberculosis contacts, which report formed the basis of an address† he delivered to the Tuberculosis Association.

The Examination of Tuberculosis Contacts.

There is reason to believe that contact examination is not regarded by most tuberculosis officers with any marked degree of enthusiasm. It is, I believe, generally felt that the results of contact examination are not commensurate with the labour and time involved.

This fact, and the doubt existing in many minds as to whether a large proportion of the contacts at one time diagnosed as tuberculous upon what appears to us now as inadequate evidence, were really suffering from active disease, render the time opportune for a reopening of the whole question.

The first thing to settle is, I think, whether the present position is satisfactory, having regard to the elaborate schemes of local authorities dealing not only with diagnosis and treatment, but also with prevention. Under the last heading may be included removal to institutions, home education and supervision as regards disposal of sputum, etc., encouragement to sleep alone with the loan, where necessary, of single bedsteads and mattresses, contact examination as at present undertaken by tuberculosis officers, and the educational propaganda in health matters emanating from dispensaries and elsewhere.

I know of no recent figures dealing with the question and so with this end in view an investigation has recently been undertaken in my area (population roughly 350,000), the object of which was to discover how many secondary cases of tuberculosis occurred up to the end of 1929 related to the cases of pulmonary tuberculosis investigated and accepted by the tuberculosis officers during the years 1921-4 inclusive. This period was chosen because by that time the full dispensary staff was again on duty after the war period. Thus, there was a minimum period of five years and a maximum period of nine years for the possible discovery of secondary cases. The results are as follow:—

Number of cases of pulmonary tuberculosis accepted as such by tuberculosis officers during years 1921-4	1,035
Number of instances where a second case subsequently was found in immediate family to end of 1929 ...	153
Percentage of above	14·77%
Average number of years between the discovery of first and second cases	3·5
Total number of tuberculosis contacts discovered in immediate family of first case to end of 1929 ...	198
Percentage of above in relation to first case discovered	19·0%

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†This address was published in "Tubercle," August, 1930.

These figures show (1) *that in 15 per cent. of the cases accepted as cases of pulmonary tuberculosis, instances of one or more secondary cases occurred.* As Lancashire is not usually regarded as a backward area in anti-tuberculosis work, there is no reason to suppose that the proportion of secondary cases is less elsewhere. We have thus a rough measure of the problem before us. (2) Nearly all the secondary cases were directly related to these primary cases where tubercle bacilli had been found in the sputum. (3) *The average interval between the discovery of the primary and secondary cases was 3½ years.* Occasionally the interval was much longer. There is thus a statistical basis for the common experience that contact examination at or about the time of diagnosis of a case of pulmonary tuberculosis is usually barren of results. Sometimes, however, by contact examination where young adults are concerned, the source of infection is discovered, or a second young adult case may be diagnosed.

In the report of the Departmental Committee on Tuberculosis in 1912 (the Astor Report) contact examination was regarded as one of the six cardinal functions of a tuberculosis dispensary, and most local authorities make some effort in this direction. A house contact has been defined as a person who has been staying in the house of a known living tuberculous case, or one who has lived in a house where a death from tuberculosis has occurred not more than six months from the date of examination. The investigation reported above shows that this period is much too short if the contact has been in close association with the deceased, and that a minimum period of four years is desirable.* There are, however, serious practical difficulties in the way of lengthening the period. It has been customary in Lancashire to regard as " contacts " such cases only as were examined through the initiative of the dispensary staff. " Suspects " who attended of their own accord, or who were referred by their medical practitioners, were not included in the official figures of contacts examined.

It must, however, be borne in mind that many secondary cases of phthisis undoubtedly occur not from infection at home, but from close association in workrooms and factories, *e.g.*, dressmakers, tailors, printers, etc. The recognition of this fact has an obvious corollary, *viz.*, the examination of workpeople known to have been in close contact over a long period with an infectious case. I will return to this point later.

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*A married woman recently examined by me and found to have tubercle bacilli in the sputum stated that she had nursed her father, who died of phthisis 13 years previously. There are doubtless many similar cases of delayed manifestations of contact infections.

It is unnecessary to quote a large number of figures as to contact examination. They are available for anyone who cares to study annual reports of local authorities. The following are the figures for Lancashire for the four years 1925-28 extracted from the annual reports of the Central Tuberculosis Officer :—

Table 16 —Contact Examinations in Administrative County of Lancaster.

Year	Number examined	Definitely Tuberculosis			T.B. rate per 1,000 contacts (suspects)	T.B. rate per 1,000 population	Percentage of contacts diagnosed as pul. tub. with T.B. in sputum.
		Pul.	Non-Pul.	Total			%
1925	1,221	56	23	79	64·7	5·15	48
1926	1,204	46	26	72	59·8	4·90	32
1927	898	66	36	102	113·5	4·63	20
1928	1,320	54	27	81	61·3	4·63	27
Average 4 years 1925–28	1,160	55	28	83	74·8	4·83	31·7

For the most part the contacts examined were in reality " suspects " and this fact accounts for the high average tuberculosis rate of 74·8 per 1,000 of those examined as compared with 4·83 per 1,000 for the population as a whole. In my own area last year an examination of 257 contacts resulted in only 5 definite cases being found. The method of procedure is as follows :—Each week the tuberculosis officers discuss with the whole-time tuberculosis dispensary nurses the home circumstances of the patients they have visited during the previous week. The nurses constantly impress upon the families of tuberculous patients the desirability of being examined *to make sure they are well and free from disease* (so much depends upon the manner in which the subject is broached), and from time to time enquire as to the health of members of infected households, and occasionally they hear of cases of suspicious illness. Concerted efforts are made in order to secure, if possible, the examination of any suspicious case, and these efforts are sometimes successful. In this connection two points may briefly be mentioned :—

(1) It is not difficult to pile up big figures as to contact examination by examining all and sundry. The readiest to permit examination are often those obviously in good health.

(2) Reluctance to be examined is a suspicious feature in itself. Such persons frequently become patients sooner or later, and a source of infection to others.

The problem of contact examination must be especially difficult in large cities, where patients are in the habit of attending general hospitals at some distance from their homes, especially if notification from the hospital is imperfectly carried out.

The place of examination may be either (a) the patient's home or (b) the dispensary. From the marked divergence of opinion amongst tuberculosis officers, it is probable that both methods have their value. Thus, in the country, examination at home is commonly the only practicable method. Many tuberculosis officers prefer to examine contacts at their dispensaries on the ground that examination there is more thorough, and this is doubtless true. On the other hand, there is much to be gained from home visits by tuberculosis officers :—

(i) They familiarise themselves with the home circumstances of the patients, and can more effectively direct the work of the nurses (prevention).

(ii) They can supervise the routine of treatment more effectively if they see for themselves how the patients are living.

(iii) The visit to examine the patient and examine contacts serves a double purpose and saves time.

(iv) Many patients will not make the effort or are unable or disinclined to attend a dispensary.

It is possible even at patients' homes for a tuberculosis officer of experience to make a definite decision as to the absence of active tuberculosis in the majority of the contacts, reserving a small minority for further investigation at the dispensary (X-ray, etc.). The knowledge of the results of the Von Pirquet test and the figures of Naegeli and others as to post-mortem findings make it clear that infection is more or less widespread as childhood is left behind, so that the essential problem as we know it to-day is to discover not tuberculosis infection but the presence of active disease—an entirely different matter.

One difficulty in contact examination is related to this fact. A contact may be examined and found free from disease, but at a later date active and extensive involvement may be found. From the investigation briefly described above it would appear that contacts of pulmonary cases, and especially of those whose sputum has contained tubercle bacilli, should be kept under observation for at least four years. Dispensary nurses find it difficult, however, to undertake this task partly owing to lack of time, but especially after the death of a primary case, as subsequent visits by them are frequently not desired by the family. It is obviously desirable to endeavour to secure the confidence of the family, and to enlighten them as to preventive measures if early symptoms are suspected, *e.g.*, a visit to the doctor or (and) attendance at the dispensary.

Another type of case occasionally met with is where, in spite of contact examination, one member of a family after another falls ill with the disease. In such cases the family resistance is presumably low, as it occurs sometimes in spite of care and cleanliness. The following is a case in point :—

D.B. Female. First examined 9/7/19. Pos. sputum. Died 3/4/20.
Brother examined 1/11/22. Pos. sputum. Died 10/4/24.
Second brother examined 20/2/25. Pos. sputum. Died 23/2/30.
Third brother examined 31/12/26. Pos. sputum. Died 31/7/27.
Fourth brother examined 6/11/29. Neg. sputum. Definite X-ray.

It is probable that in the past too much attention was paid to the examination of child contacts and too little to the adults. Nowadays whenever a child or young adult patient is notified or diagnosed, I immediately think of the adults in the house and sometimes a source of infection is found. The worst offenders are not infrequently very reluctant to be examined. The following is a case in point :—

Mrs. B., aged 69. Complained of chest trouble for twenty years. Afraid to be examined by tuberculosis officer although advised by own doctor. Daughter (pos. sputum) died from tuberculosis 1929. Mrs. B. has definite disease in lungs and also tub. wrist.

It has been suggested that compulsory power for the examination of contacts should be available. On the one hand it may be argued that concealment of the disease would tend to increase and that repeated examinations would be necessary. On the other hand the mere fact that the power existed would probably be sufficient (*e.g.*, hospital treatment for infectious cases). Medical examinations are nowadays becoming general and they are likely to increase. We have already the following :—

(1) Pre-natal clinics and infant welfare centres.
(2) School clinics (school medical officer).
(3) Examination of entrants into factories and workshops (factory surgeon).
(4) Examination of entrants into the service of the State or public bodies.
(5) Examination of applicants for pensions and disability allowances.
(6) Examination in compensation cases and insurance cases.

All of the above provide from time to time a portion of the clientele of the tuberculosis officer, and in any wider system of medical inspection of adults he would, as at present, be available for consultation. The increasing familiarity of the public with medical inspection and the general dissemination of the knowledge of hygiene, etc., through the schools and otherwise cannot fail to bear fruit, not only in the direction of better health but with regard to a saner view as to the value of preventive medical examinations. In fact, the time may come when it will be the primary function of the general practitioner to endeavour to keep in health a definite number of families.

Conclusions.

The results of the limited investigation described above show that:

(a) Known cases of pulmonary tuberculosis give rise to at least 15 per cent. secondary cases in spite of modern anti-tuberculosis measures.

(b) The average interval between the discovery of primary and secondary cases is three and a half years.

Related to the above, but not primarily based upon statistics, the following conclusions are tentatively put forward :—

1.—The most profitable contact work is to be done amongst the families of patients whose sputum has contained tubercle bacilli, as these produce nearly all the secondary cases. It is generally a waste of time to trouble about the contacts of negative cases, or of non-pulmonary cases, except from the point of view of seeking the primary source of infection of these.

2.—Even as regards the tuberculous positive sputum cases, it will be found most profitable as a rule to limit one's energies to contacts on whom for some reason or other suspicion rests (suspects).

3.—Close contacts of patients whose sputum has contained tubercle bacilli should, if possible, be kept under observation and re-examined at intervals for at least four years. A single negative examination result may well lead to a false sense of security.

4.—The place of examination must depend upon local circumstances. The dispensary is obviously the most comfortable and convenient place, but tuberculosis officers can frequently do good work during their home visits to patients, and by neglecting such visitation they miss many opportunities of useful service.

5.—Relatively more attention should be paid to adult, and especially middle-aged, contacts, who are not infrequently the source of infection. The child contacts might with advantage be transferred to the school medical officer with an understanding that any " suspects " be referred to the dispensary.

6.—Where there is reason to suspect the possibility of infection in a workroom, office, etc., some effort ought to be made to secure that a discreet lookout is kept for suspicious coughs or ill-health amongst those in the immediate vicinity. In large concerns welfare workers might help.

7.—The widespread dissemination of knowledge on health subjects beginning at school, the growing familiarity of the public with medical examinations, and in particular the regard and esteem which efficient dispensaries must inevitably earn (as is the case with the old established hospitals) will all tend more and more to facilitate the examination of suitable contacts.

8.—Lastly, although the difficulties are often considerable they can frequently be lessened where steady pressure, based on enthusiasm and energy, is tactfully applied.

VII.—NOTIFICATION OF TUBERCULOSIS CASES.

It is the statutory duty of every medical practitioner to notify within 48 hours to the local medical officer of health any case of tuberculosis occurring in his practice, and the medical officer of health is charged with the duty of keeping a register of such cases reported in his sanitary district.

According to the returns made by the local medical officers of health to the County Council for the last quarter of 1929, there was a total of 12,798 tuberculous persons on the registers of the 119 sanitary authorities in the County. This figure includes, however, all the notified cases in mental hospitals, public assistance hospitals and other institutions, and cases which are not suitable for treatment under the County scheme. The local registers are not all yet entirely correct, but one by one, as time permits, they are being compared with the County records of cases and, where necessary, corrections made to bring them up to date. This scrutiny of registers has involved much additional work at the central office and at the dispensaries, particularly in dealing with cases notified ten to fifteen years ago.

Non-Notification.

I have continued to direct special attention to the notification of cases of tuberculosis, and have engaged in correspondence with medical practitioners, medical officers of health, and medical superintendents, over many individual cases.

The extent of non-notification of pulmonary cases in the Administrative County is shown in the following statement :—

Table 17.

	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	**1929**
Number of deaths from pulmonary tuberculosis recorded … …	1652	1339	1323	1301	1362	1250	1215	1205	1158	1105	1066	1102
Number of these deaths not notified under Regulations during life	303	221	177	135	105	85	64	67	58	54	56	62

The substantial improvement which has been secured in the notification of cases of pulmonary tuberculosis before death would not have been practicable without the cordial co-operation of the local medical officers of health and, of course, the general practitioners who make the notifications.

There is no doubt that in this Administrative County a much smaller proportion of cases of tuberculosis escapes notification than is frequently the experience in other parts of the country. Thus, we have fewer unknown cases or unknown sources of infection remaining outside the measures for the control of tuberculosis.

For non-pulmonary tuberculosis, there were 61 non-notified fatal cases in 1929, which on the total deaths from this form of the disease equalled 21·8 per cent.

Reasons for Non-Notification.

Since 1920 special investigations have been made into every individual death recorded from tuberculosis which had not been previously notified as a case under the Regulations, and the results of the investigations in 1929—which confirmed the findings of previous years—showed that (*a*) 16·3 per cent. of the deaths at private addresses related mainly to fulminating cases of pulmonary tuberculosis in adults and acute cases of meningitis in children, with no doctor in attendance at all, or only for a matter of a few days prior to death; (*b*) 17·4 per cent. were complicated cases presenting difficulty in diagnosis; (*c*) in 16·3 per cent. notification was not made owing to a misunderstanding of the Tuberculosis Regulations or to the belief that the case had already been notified by another practitioner; (*d*) 27·9 per cent. represented patients who were temporary residents or were already known to the tuberculosis officer, accidental omission on the part of the medical attendant to notify, and cases in which information not ascertained; (*e*) 16·3 per cent. were cases notified after death (in some instances after post-mortem examination), or where tuberculosis was not the primary cause of death; (*f*) the instances in which there appeared to be no reasonable excuse for non-notification represented 5·8 per cent.

The efficiency of notification varies directly with the efficiency of the county council or county borough scheme dealing with tuberculosis. If there is no really comprehensive scheme, if there are poor and newly qualified, part-time, and badly paid tuberculosis officers, if there are insufficient means for expert diagnosis, and too few beds for treatment, then a high proportion of non-notified fatal cases will be the rule and not the exception.

TOTAL "KNOWN SOURCES OF POSSIBLE INFECTION."

One effect of the better notification of cases by practitioners has been to throw up the number of new cases in recent years and statistically to make the figures disadvantageously comparable with the earlier years when a larger number of cases escaped notification.

It is, however, possible to obtain a truer record of the number of cases of pulmonary tuberculosis occurring year by year by adding together (*a*) the notifications and (*b*) the deaths which occurred without notification being made during life ; this total gives clearly the number of known sources of possible infection as the following table shows :—

TABLE 18.

YEAR	Pulmonary Tuberculosis.			
	Cases Notified (during life)	Cases reported at time of death only.	Total known sources of possible infection.	Rate per 1,000 of population on col. (4).
(1)	(2)	(3)	(4)	(5)
1918	2,534	303	2,837	1·64
1919	2,105	221	2,326	1·34
1920	2,084	177	2,261	1·30
1921	2,044	135	2,179	1·23
1922	1,863	105	1,968	1·11
1923	1,937	85	2,022	1·13
1924	1,972	64	2,036	1·14
1925	1,846	67	1,913	1·07
1926	1,828	58	1,886	1·05
1927	1,794	54	1,848	1·02
1928	1,660	56	1,716	0·94
1929	1,517	62	1,579	0·87

The decline in the number of *known* sources of possible infection of pulmonary tuberculosis is therefore considerably greater than the fall in the notified cases if taken alone.

VIII.—APPLICATIONS FOR TREATMENT.

Table 19 below shows the number of " new " patients (1,923) who applied for treatment under the County scheme during the year 1929 :—

Table 19.

	Number of Applications received during 1929.	Diagnosis of New Applicants for Treatment.			
		Pulmonary Cases.	Pulmonary and Non-Pulmonary.	Non-Pulmonary Cases.	Diagnosis not Confirmed (non-tuberculous).
Men	758	598	14	139	7
Women ...	705	488	9	194	14
Boys	257	33	4	213	7
Girls	203	27	7	166	3
Total ...	1923	1146	34	712	31

Applications received in previous years were :—1918–21 average, 2,294 ; 1922–25 average, 2,183 ; 1926, 2,278 ; 1927, 2,369 ; 1928, 2,138, compared with 1929, 1,923. Thus there were 215 fewer applications than in 1928.

During 1929, there were 2,430 cases notified under the Public Health (Tuberculosis) Regulations as suffering from tuberculosis (all forms) ; whereas the number of persons who applied for treatment to the County Council was 1,923, equal to 79 per cent. of the notifications.

With regard to the balance (namely 21 per cent.) of the notifications, where the patients did not apply to the County Council for treatment, the principal reasons for this were : patients suffering from tuberculous meningitis or other fatal forms of the disease ; patients removed out of County area ; cases in which the diagnosis was not confirmed and no treatment required ; patients resident in mental hospitals and other public institutions, and patients who, for some reason or other, did not wish to avail themselves of the benefits under the County scheme.

CLASSIFICATION OF NEW PATIENTS.

(a) *Pulmonary Tuberculosis.*

During 1929, applications for treatment were received from 1,180 new patients, and these were reported by the tuberculosis officers to be in the undermentioned stages of the disease on the first examination :—

T.B. Minus (Sputum negative or absent)	423, or	35·8	per cent.
T.B. Plus 1 (Early cases, sputum positive) ...	77, or	6·5	,, ,,
T.B. Plus 2 (Intermediate cases, sputum positive) ...	497, or	42·1	,, ,,
T.B. Plus 3 (Advanced cases, sputum positive) ...	183, or	15·5	,, ,,
	1,180	100·0	,, ,,

It is well known that, throughout the country, tuberculosis officers do not see many of the new cases in the early stage of the disease. Some patients through ignorance, others on account of economic reasons, neglect to consult a doctor when in the early stage, and so lessen their chance of recovery. In the Administrative County we have for several years made special investigations into the reasons underlying such disastrous delay on the part of patients. These investigations have been continued in 1929, yielding the following conclusions which correspond very closely with the conclusions published in previous reports :—

1.—Altogether 69 per cent. of the 183 advanced cases either had no doctor or had only been attending their doctor for less than two months when first examined by the tuberculosis officer or notified. The corresponding percentage in 1928 was 69.

2.—After making allowance for a percentage of fulminating cases ("galloping consumption"), a large proportion—nearly three-fourths—of patients had felt ill for one or more months before consulting a doctor.

3.—The reason for late notification and patients delaying their application until in an advanced stage of the disease is chiefly the disinclination or unwillingness of the patients to report themselves to their doctor when feeling ill. This is due mainly to the insidious onset of the disease, the discomfort being only slight at first.

4.—There does not appear to be evidence in any large number of cases of unreasonable delay on the part of family doctors referring cases to the tuberculosis officer.

5.—The initiative to seek treatment when ill rests with the patient himself, and the only feasible remedy lies in the education of the public as to symptoms and common dangers of tuberculosis and the need for securing prompt treatment. This cannot be too strongly or too often emphasised.

With regard to the last conclusion 5, there are many difficulties in the way of reaching the people who most require such education. On the tuberculosis officer rests chiefly the duty of stimulating public interest, but an increasing number of sanitary authorities and voluntary care committees are assisting in propaganda work. More satisfactory results will, I think, accrue now that steps are being taken to teach hygiene to the older children at school following on the issue in January, 1928, by the Board of Education of a " Handbook of suggestions on Health Education for the consideration of teachers and others concerned in the work of public elementary schools."

The tuberculosis medical staff have to depend very largely on the general practitioners throughout the County for bringing forward tuberculous patients, and it is satisfactory to note that 86 per cent. of new cases are sent *before notification* to the tuberculosis officers for an opinion as to diagnosis. Too much importance is still laid by some doctors on sputum examinations alone, and often too long a time is allowed to elapse in order that the sputum may be tested; or steps are not taken to report the case until it is returned as " positive."

(*b*) *Non-Pulmonary Tuberculosis.*

There were 712 new cases diagnosed by the tuberculosis officers as suffering from non-pulmonary tuberculosis in the following forms :—

Bones, joints and spine	202	712
Abdomen	114	
Other organs	29	
Peripheral glands	317	
Skin	50	

In 1928 the number of applications from non-pulmonary cases was 769.

IX.—THE DISPENSARY ORGANISATION.

The efficiency of a tuberculosis scheme depends directly on the kind of dispensary organisation set up, and while much prominence is given to work done at hospitals and sanatoria, the dispensary organisation is undoubtedly of primary importance because the whole basis of the work here is towards early diagnosis and prevention rather than cure. The tuberculosis officer and staff have to carry out the most delicate duties, working in the closest co-operation with practitioners and health officials, diagnosing with due sense of responsibility cases referred to them, advising appropriate form of treatment, investigating tactfully the home conditions, and supervising home treatment

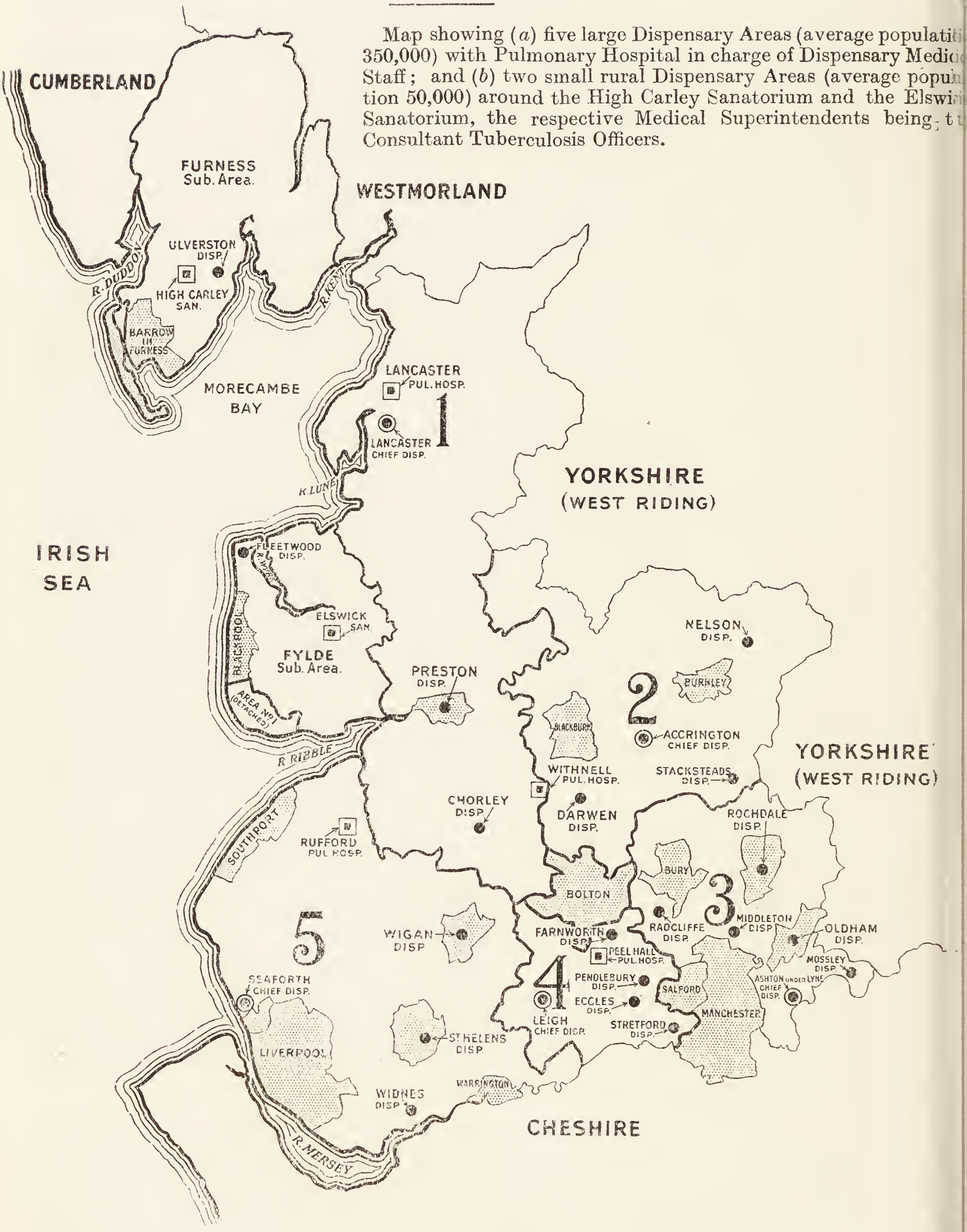
A tuberculosis dispensary should be the centre of activity, for a town or district, in regard to measures for the prevention of the disease, the expert examination and diagnosis of cases, together with the supervision, special treatment, and care of all known tuberculous persons. The tuberculosis officer himself should be a first-rate clinician, of mature judgment and experience, of high professional standing, possessing expert and up-to-date knowledge of tuberculosis in its varied phases, and looked upon as a consultant by the general practitioners ; he must have tact, discrimination, and administrative ability.

For dispensary purposes, the Administrative County is divided into five large areas, average population 350,000, and two sub-areas. Each large area is under the charge of a consultant tuberculosis officer, and to help the consultants there are nine assistant tuberculosis officers, 33 tuberculosis health visitors, and clerical staff. In each dispensary area there is a chief dispensary at which is co-ordinated the whole of the work required in that particular area, and, in addition, branch dispensaries have been provided. The aim of the County Council has been to provide in each area a pulmonary hospital containing about 50 beds for the diagnosis of observation cases and the treatment of intermediate and advanced cases of pulmonary tuberculosis near their homes, the consultant tuberculosis officer of the particular dispensary area acting as the visiting medical superintendent. The two sub-areas—Furness and Fylde—are in the charge respectively of the medical superintendent of the High Carley Sanatorium and the Elswick Sanatorium. Thus, the dispensary side of the work is not divorced from the institutional side.

In order to illustrate the main features underlying the dispensary organisation I have had prepared (*a*) a small scale map showing the Administrative County divided into the five dispensary areas and two sub-areas, with the dispensaries, pulmonary hospitals, and sanatoria in each area under the charge of the consultant tuberculosis officer ; and (*b*) a chart setting out the more important items for which a consultant tuberculosis officer of a dispensary area is responsible.

DISPENSARY ORGANISATION.

Map showing (*a*) five large Dispensary Areas (average populati 350,000) with Pulmonary Hospital in charge of Dispensary Medic Staff; and (*b*) two small rural Dispensary Areas (average popu tion 50,000) around the High Carley Sanatorium and the Elswi Sanatorium, the respective Medical Superintendents being t Consultant Tuberculosis Officers.

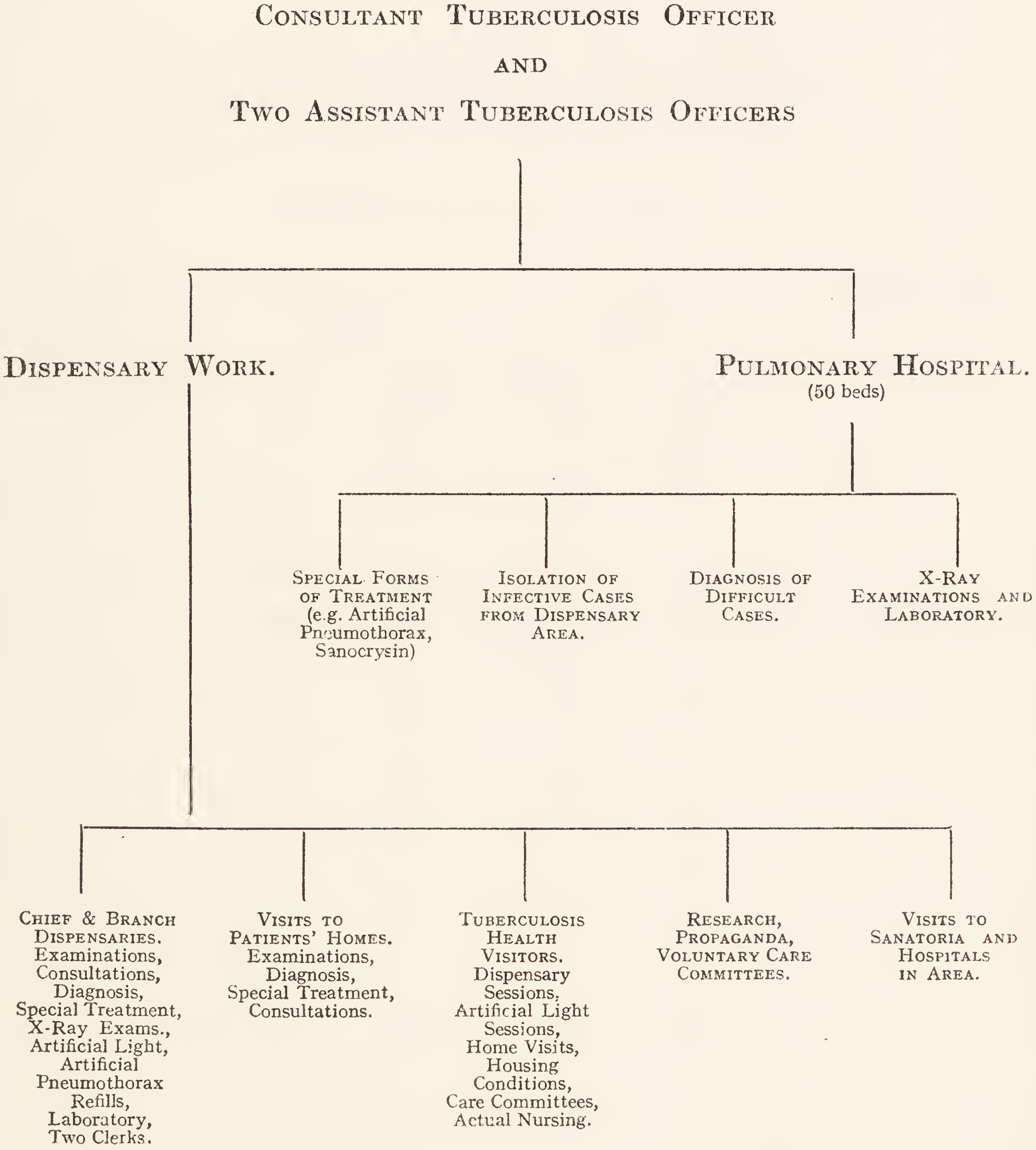


Administrative County : Population (estimated 1929) 1,811,700.
Area 1,050,889 acres.

County Boroughs, shaded, do not form part of the Administrative County.

THE DISPENSARY ORGANISATION.

As shown on the map opposite, the Administrative County is divided into five large dispensary areas (average population 350,000). The chart below illustrates the organisation and work of one of these dispensary areas:—


CONSULTANT TUBERCULOSIS OFFICER
AND
TWO ASSISTANT TUBERCULOSIS OFFICERS
DISPENSARY WORK.
PULMONARY HOSPITAL. (50 beds)
SPECIAL FORMS OF TREATMENT (e.g. Artificial Pneumothorax, Sanocrysin)
ISOLATION OF INFECTIVE CASES FROM DISPENSARY AREA.
DIAGNOSIS OF DIFFICULT CASES.
X-RAY EXAMINATIONS AND LABORATORY.
CHIEF & BRANCH DISPENSARIES. Examinations, Consultations, Diagnosis, Special Treatment, X-Ray Exams., Artificial Light, Artificial Pneumothorax Refills, Laboratory, Two Clerks.
VISITS TO PATIENTS' HOMES. Examinations, Diagnosis, Special Treatment, Consultations.
TUBERCULOSIS HEALTH VISITORS. Dispensary Sessions, Artificial Light Sessions, Home Visits, Housing Conditions, Care Committees, Actual Nursing.
RESEARCH, PROPAGANDA, VOLUNTARY CARE COMMITTEES.
VISITS TO SANATORIA AND HOSPITALS IN AREA.

The remainder of this chapter summarises the work done through the dispensary organisation during the year 1929.

NUMBER OF CASES UNDER SUPERVISION ON 31ST DECEMBER, 1929.

Table 20 shows the total number of persons in each area who were suffering or suspected to be suffering from tuberculosis, and who were under the supervision of the dispensary staff at the end of 1929. As a matter of interest, the number of cases per 1,000 of the population has also been calculated for each area :—

TABLE 20.—*Tuberculous Cases on Dispensary Registers on 31st Dec., 1929 (including 874 patients in Sanatoria and Hospitals).*

Dispensary Area.	Estimated Population, 31-12-29.	Number of Cases under Supervision on 31-12-29.						No. of Cases of Tuberculosis under supervision per 1,000 of Population.	No. of Doubtful Cases on 31-12-29.
		Sex.	Pulmonary Tuberculosis.		Non-Pulmonary Tuberculosis.		Total No. of Cases.		
			Under 15 years of age.	15 years and over.	Under 15 years of age.	15 years and over.			
No. 1	261,465	M	52	275	116	124	1092	4·17	1
		F	28	218	125	154			
No. 2	354,645	M	9	331	85	148	1092	3·07	11
		F	7	265	71	176			
No. 3	375,658	M	26	503	153	201	1737	4·62	—
		F	33	416	106	269			
No. 4	344,774	M	28	497	152	211	1681	4·87	—
		F	17	386	141	249			
No. 5	374,567	M	79	572	259	187	2030	5·41	11
		F	88	427	186	232			
Furness	38,657	M	19	86	14	20	279	7·21	2
		F	22	78	12	28			
Fylde	61,934	M	8	92	56	44	397	6·24	1
		F	13	102	42	40			
TOTAL	1,811,700	M	221	2356	835	935	8308	4·58	26
		F	208	1922	683	1148			
			4707		3601				

The particulars of the patients on the County register at the end of the year have been further sub-divided in Appendix III so as to show the classification, whether active or quiescent, age-group and sex.

TABLE A.

DISPENSARY ORGANISATION.

AREAS, MEDICAL STAFF, NURSING STAFF, DISPENSARIES, AND TIMES OF DISPENSARY SESSIONS.

LANCASHIRE COUNTY COUNCIL.

Table A.—List of Tuberculosis Dispensaries in use in October, 1930, and the Tuberculosis Officers for the Dispensary Areas.

	SANITARY DISTRICTS.	Estimated Civilian Population 31/12/29.	MEDICAL STAFF October, 1930.	NURSING STAFF.	DISPENSARIES (Chief and Branch).	Days and Hours of DISPENSARY SESSIONS (Distinct from Home Visiting, attending Sanatoria, Hospitals and Care Committees, etc.).
	Adlington Blackrod Carnforth Chorley (B.) Chorley (R.) Croston Fulwood Garstang (R.), Part of, consisting of parishes of— Barnacre-with-Bonds Bilsborrow Bleasdale Cabus Garstang (R.) *cont.* Catterall Claughton Cleveley Forton Garstang Holleth Kirkland Myerscough Nateby Nether Wyresdale Winmarleigh Horwich Lancaster (B.) Lancaster (R.) Leyland Longridge Lunesdale (R.) Lytham St. Annes (B.) Morecambe & Heysham (B.) Preston (R.) Walton-le-Dale Withnell	261,465	Dr. A. D. Brunwin, Tuberculosis Dispensary, 8 Middle Street, Lancaster. Assistant Tuberculosis Officer— Dr. G. H. Leigh.	Nurse L. Walker	Lancaster (Chief), 8 Middle Street (Tel. No. 568). (X-ray Apparatus and Artificial Light Installation).	Monday, 11 a.m. Other days by appointment. 2nd Monday evening of month by appointment.
				Nurse F. D. Abbott Nurse G. M. Hunter	Chorley (Branch), 59 Gillibrand St. (Tel. No. 263). (Artificial Light Installation).	Monday by appointment. Thursday, 11 a.m. 2nd Tuesday evening of month by appointment.
				Nurse J. Skelcher	Preston (Branch), 22 Bolton Street (Tel. No. 1111). (Artificial Light Installation).	Wednesday, 11 a.m. Monday evening before 2nd Tuesday of month by appointment.
	Furness Sub-Area— Dalton-in-Furness Grange-over-Sands Ulverston Ulverston (R.)	38,657	Dr. E. H. A. Pask, High Carley Sanatorium, near Ulverston (Tel. No. 110 Ulverston).	Nurse E. A. Duston	Ulverston (Branch), Virginia House, Queen Street, (Tel. No. 145). (Artificial Light Installation). (X-ray Apparatus at High Carley Sanatorium).	Tuesday, 10 a.m. Thursday. 10 a.m.
	Fylde Sub-Area— Fleetwood Fylde (R.) Garstang (R.), Part of, consisting of parishes of— Great Eccleston Hambleton Garstang (R.) *cont.* Inskip-with-Sowerby Out Rawcliffe Pilling Stalmine-with-Stainall Upper Rawcliffe Kirkham Poulton-le-Fylde Preesall Thornton Cleveleys	61,934	Dr. G. Leggat, Elswick Sanatorium, near Kirkham (Tel. No. 22 Great Eccleston).	Nurse A. Tweedy	Fleetwood (Branch), 23 Poulton Rd. (Tel. No. 282). (Artificial Light Installation). (X-ray Apparatus at Elswick Sanatorium).	Tuesday, 10 a.m.
2	Accrington (B.) Bacup (B.) Barrowford Blackburn (R.) Brierfield Burnley (R.) Church Clayton-le-Moors Clitheroe (B.) Clitheroe (R.) Colne (B.) Darwen (B.) Great Harwood Haslingden (B.) Nelson (B.) Oswaldtwistle Padiham Rawtenstall (B.) Rishton Trawden Turton	354,645	Dr. B. MacPhee, Tuberculosis Dispensary, 39 Avenue Parade, Accrington. Assistant Tuberculosis Officers— Dr. S. C. Adam Dr. F. C. S. Bradbury	Nurse L. F. Norwood Nurse E. Watterson	Accrington (Chief), 39 Avenue Parade (Tel. No. 2443).	Tuesday, 2 p.m. Wednesday, 2 p.m. 2nd Tuesday of month, 6 p.m.
				Nurse M. Duggan	Darwen (Branch), 20 Railway Road (Tel. No. 408). (X-ray Apparatus).	Monday, 10 a.m.
				Nurse A. Munro Nurse H. M. Alcock	Nelson (Branch), 64 Carr Road (Tel. No. 507). (Artificial Light Installation).	Tuesday, 2 p.m. Friday by appointment.
				Nurse R. Lambert	Stacksteads (Branch), Knott Hill House (Tel. No. 201 Bacup). (Artificial Light Installation).	Monday, 2 p.m. 1st Monday of month, 6 p.m.
3	Ashton-under-Lyne (B.) Audenshaw Bury (R.) Chadderton Crompton Denton Droylsden Failsworth Heywood (B.) Lees Limehurst (R.) Littleborough Middleton (B.) Milnrow Mossley (B.) Norden Prestwich Radcliffe Ramsbottom Royton Tottington Wardle Whitefield Whitworth	375,658	Dr. G. Fletcher, Tuberculosis Dispensary, Boston House, Warrington Street, Ashton-under-Lyne. Assistant Tuberculosis Officers— Dr. C. Berry Dr. J. Cathcart	Nurse C. Guilfoy Nurse H. Dewsnap Nurse M. Sherwen	Ashton-under-Lyne (Chief), Boston House, Warrington Street (Tel. No. 775). (X-ray Apparatus and Artificial Light Installation).	Monday, 10-30 a.m. for X-ray examinations. Tuesday, 2-30 p.m. Friday, 10 a.m. 1st Tuesday of month, 6-30 p.m.
				Nurse M. A. Potter	Middleton (Branch), 71 Manchester Old Road. (Tel. No. 106).	Friday, 2-30 p.m. 2nd Friday of month, 6-30 p.m.
				Nurse M. Sherwen	Mossley (Branch), Park Lodge.	Tuesday, 11 a.m.
				Nurse I. F. MacDonald	Oldham (Branch), 25 Barker Street (Tel. No. 1671).	Monday, 2-30 p.m. Wednesday, 10 a.m. 2nd Monday of month, 6-30 p.m.
				Nurse A. Flynn Nurse H. Dewsnap Nurse M. Sherwen	Radcliffe (Branch), 41 Darbyshire Street (Tel. No. 2323). (Artificial Light Installation).	Wednesday, 2 p.m. 3rd Wed. of month, 6-30 p.m.
				Nurse W. Swift	Rochdale (Branch), 168 Drake St., (Tel. No. 3892).	Thursday, 10-30 a.m. 2nd Thursday of month, 6-30 p.m.
4	Atherton Barton-upon-Irwell (R.) Eccles (B.) Farnworth Irlam Kearsley Leigh (B.) Leigh (R.) Little Hulton Little Lever Stretford Swinton and Pendlebury Tyldesley-with-Shakerley Urmston Westhoughton Worsley	344,774	Dr. G. Jessel, Tuberculosis Dispensary, 13 Church Street, Leigh. Assistant Tuberculosis Officers— Dr. A. B. Jamieson Dr. H. J. Villiers	Nurse A. Worsley Nurse I. M. Corfield	Leigh (Chief), 13 Church Street (Tel. No. 258).	Wednesday, 9-30 a.m. Friday, 9-30 a.m. 2nd Thurs. of month, 6-30 p.m.
				Nurse M. B. Jones Nurse H. M. Shakespeare	Eccles (Branch), 28 and 30 Gilda Brook Road (Tel. No. 3533). (X-ray Apparatus and Artificial Light Installation).	Tuesday, 2 p.m.: 2-30 p.m. for X-ray examinations. Thursday, 2-30 p.m. for X-ray examinations. Friday, 9-30 a.m. 1st Wed. of month, 6-30 p.m.
				Nurse F. G. Smith	Farnworth (Branch), 19–23 Darley Street (Tel. No. 63).	Tuesday, 9-30 a.m. Friday, 2 p.m. 3rd Thurs. of month, 6-30 p.m.
				Nurse A. Dickinson	Pendlebury (Branch), 121 Station Road (Tel. No. 1895 Swinton).	Monday, 2 p.m. Wednesday, 9-30 a.m. Last Thurs. of month, 6-30 p.m.
				Nurse K. Blakemore	Stretford (Branch), 14 Derbyshire Lane (Tel. No. 2010 Longford).	Tuesday, 9-30 a.m. Thursday, 9-30 a.m. Last Monday of month, 6-30 p.m.
5	Abram Ashton-in-Makerfield Aspull Billinge and Winstanley Formby Golborne Great Crosby Haydock Hindley Huyton-with-Roby Ince-in-Makerfield Lathom and Burscough Litherland Little Crosby Newton-in-Makerfield Ormskirk Orrell Prescot Rainford Sefton (R.) Skelmersdale Standish-with-Langtree Upholland Warrington (R.) Waterloo-with-Seaforth West Lancashire (R.) Whiston (R.) Widnes (B.) Wigan (R.)	374,567	Dr. C. W. Laird, Tuberculosis Dispensary, 7 Claremont Road, Seaforth. Assistant Tuberculosis Officers— Dr. C. H. Lilley Dr. G. B. Charnock	Nurse A. Duncan	Seaforth (Chief), 7 Claremont Road (Tel. No. 688 Waterloo). (X-ray Apparatus).	Monday, 3 to 4-30 p.m. Thursday, 10-30 a.m. for X-ray examinations. Friday, 10 to 11-30 a.m. 3rd Thursday of month, 6 p.m.
				Nurse E. Walch Nurse I. Laing Nurse L. Farquhar	St. Helens (Branch), 90 Hardshaw Street (Tel. No. 916). (Artificial Light Installation).	Tuesday, 3 to 4-30 p.m. Last Tues. of month, 6 to 7 p.m.
				Nurse M. J. Wilson	Widnes (Branch). Brendan House, Widnes Road (Tel. No. 156).	Monday, 10 to 11-30 a.m. Friday, 2-30 to 4-30 p.m. 1st Wed. of month, 6 to 7 p.m.
				Nurse E. Walters Nurse M. J. Evans	Wigan (Branch), 3 Mesnes Park Terrace (Tel. No. 1172). (Artificial Light Installation).	Monday, 9-30 a.m. Thursday, 9-30 a.m. 4th Thurs. of month, 6-30 p.m.
		1,811.700				

STATISTICS REQUIRED BY MINISTRY OF HEALTH.

By Memorandum 37/T, issued in September, 1925, the Ministry require certain information concerning the work done at tuberculosis dispensaries. These statistics, in the compulsory Table I of the Memorandum, are given in Appendix V of this report.

TUBERCULOSIS DISPENSARIES AND STAFF.

Table A, here inserted, shows the dispensary areas with the populations, present staffs, the addresses of the 24 dispensaries at present in use, and the days and times on which they are open.

TUBERCULOUS EX-SERVICEMEN.

Of the 8,308 patients under supervision of the dispensary staff at the end of 1929, 317 were discharged sailors, soldiers or airmen whose disease was held by the Ministry of Pensions to be attributable to or aggravated by service in the Great War, a pension being granted for the disability. The number of these tuberculous pensioners is declining, falling from 1,017 at the end of 1922 to the figure of 317 mentioned above.

EVENING SESSIONS AT DISPENSARIES.

As in previous years, the evening sessions have been regularly held at most of the dispensaries for the convenience of patients who are at work during the day.

ARTIFICIAL LIGHT TREATMENT.

A report on the work done at the artificial light centres established at twelve of the dispensaries is given in Chapter IV.

TUBERCULOSIS OFFICERS' VISITS TO SANATORIA AND HOSPITALS.

Periodical visits (mostly monthly) have continued to be paid by one or other of the consultant tuberculosis officers to the majority of the pulmonary hospitals, non-County sanatoria, and special hospitals treating County patients. These visits are of mutual help, inasmuch as they keep in touch the medical superintendent and the tuberculosis officer, who are able to confer on the patients' future treatment, the home circumstances, the provisions of the County scheme, and so on.

SUMMARY OF DISPENSARY WORK DONE BY TUBERCULOSIS OFFICERS IN 1929, SHOWING COMPARISON WITH 1928.

VISITS BY TUBERCULOSIS OFFICERS TO PATIENTS' HOMES—	1928	1929
(*a*) Number of new persons (including new contacts) examined for diagnosis or expert opinion	1,564	1,510
(*b*) Number of re-examinations of "old" cases and "old" contacts—		
1. Respecting continued general supervision or dispensary treatment	3,954	3,673
2. Contacts respecting diagnosis	26	5
3. Other cases respecting diagnosis	175	151
4. For special forms of treatment or examinations resulting therefrom—		
Aspirations	9	18
Adjustment of splints and surgical appliances	489	309
Lupus	37	44
Pneumothorax (induction and refills)	—	1
Tuberculin	4	—
Other forms	—	40
	6,258	5,751

DISPENSARY ATTENDANCES BY PATIENTS—	1928	1929
(*a*) Number of new persons (including new contacts) examined for diagnosis or expert opinion	4,244	4,001
(*b*) Number of re-examinations of "old" cases and "old" contacts—		
1. Respecting continued general supervision or dispensary treatment	15,279	14,112
2. Contacts respecting diagnosis	368	348
3. Other cases respecting diagnosis	2,254	2,149
4. For special forms of treatment or examinations resulting therefrom—		
Artificial light (Lancaster, Chorley, Preston, Nelson, Stacksteads, Ashton-under-Lyne, Radcliffe, Eccles, St. Helens, Wigan, Ulverston and Fleetwood Dispensaries)	35,037	37,113
Aspirations	94	69
Adjustment of splints and surgical appliances	857	774
Lupus	350	478
Pneumothorax (induction and refills)	71	121
Tuberculin	189	267
Other forms	149	176
	58,892	59,608

X-RAY EXAMINATIONS MADE AT COUNTY DISPENSARIES AND INSTITUTIONS—	1928	1929
(*a*) Dispensary patients	6,191	5,883
(*b*) Institutional patients	1,244	2,143
	7,435	8,026
EXAMINATIONS OF SPUTUM AT COUNTY DISPENSARIES	5,660	5,622

NUMBER OF RECOMMENDATIONS BY TUBERCULOSIS OFFICERS—	1928	1929
1. Sanatorium or hospital treatment	1,924	1,762
2. Dispensary treatment or general supervision	11,885	10,180
3. Provision of special nourishment	1,520	1,606
4. Provision of surgical appliances	171	166
5. Loan of shelters	14	12
6. Diagnosis not confirmed—		
(*a*) Notified cases	211	164
(*b*) Non-notified cases	4	6
7. Cases written off the Register as refusing treatment	44	40
8. Pulmonary cases written off the Register as cured	349	263
9. Non-pulmonary cases written off the Register as cured	502	868

	1928	1929
CARE COMMITTEE MEETINGS ATTENDED BY—		
(*a*) Tuberculosis officers	95	91
(*b*) Tuberculosis health visitors	155	160
LECTURES OR ADDRESSES GIVEN ON TUBERCULOSIS	22	8
VISITS BY TUBERCULOSIS OFFICERS TO SANATORIA, PULMONARY, SPECIAL, AND PUBLIC ASSISTANCE HOSPITALS...	221	258
SPECIAL VISITS BY TUBERCULOSIS OFFICERS (*i.e.*, interviews with medical officers of health, general hospital officials, &c.) ...	69	97
EXAMINATIONS OF ENTRANTS TO INDUSTRY UNDER SANDSTONE INDUSTRY (SILICOSIS) SCHEME, 1929	—	3
VISITS BY DISPENSARY NURSES TO PATIENTS' HOMES—		
Routine visits	41,657	38,336
Actual nursing	878	1,357
Application of surgical dressings...	1,043	1,440
Adjustment of splints and surgical appliances	2,311	1,743
	45,889	42,876
PATIENTS' DISPENSARY ATTENDANCES FOR ATTENTION BY NURSES—		
Application of surgical dressings...	2,784	2,796
Adjustment of splints and surgical appliances	291	529
	3,075	3,325

HOUSING.

The following table shows the housing conditions of all patients under treatment or supervision at the end of 1929. Whilst every effort is made to secure that infectious cases occupy a separate room, or at least a separate bed, no useful purpose is served by making the same insistence in regard to patients with the disease quiescent or arrested. The non-pulmonary cases are given separately, and only a very small number indeed may be considered infectious.

TABLE 21.—*Housing Statistics of 8,308 County Patients.*

		Patients occupying Separate Bedroom.	Patients occupying Separate Bed, but not Separate Bedroom.	Patients not occupying a Separate Bed.
Number of Pulmonary cases *considered infectious.*	Under 15 years	6	10	2*
	15 and over ...	1,224	502	100*
Number of Pulmonary cases *not* considered infectious.	Under 15 years	58	187	166
	15 and over ...	901	499	1,052
Number of Non-Pulmonary cases.	Under 15 years	171	620	727
	15 and over ...	539	436	1,108
TOTAL ...	Under 15 years	235	817	895
	15 and over ...	2,664	1,437	2,260

* 23 of these 102 cases were isolated in sanatoria or pulmonary hospitals at the end of 1929.

It will be seen that 102 patients (including two children) suffering from pulmonary tuberculosis and considered to be infectious were not occupying a separate bed when at home at the time the census of the housing conditions was made at the end of 1929. Of this number, 23 were away from home and isolated in pulmonary hospitals or sanatoria, leaving (from a total of 1,844 infectious cases) 79, or 4·2 per cent., infectious cases at home not occupying a separate bed.

This percentage of 4·2 infectious cases at home and not occupying a separate bed is the lowest proportion recorded for the County. The better housing of tuberculous persons has undoubtedly been assisted by the housing schemes of local authorities. Of the 4,707 definite cases of pulmonary tuberculosis on the register at the end of 1929, a special enquiry has shown that 304 of these patients resided in houses built by local authorities and let at a rental. In many districts special consideration has been given to tuberculous patients with unsatisfactory home conditions, and the following districts may be mentioned as possessing the largest number of tuberculous persons accommodated in council houses :—Stretford, 27 ; Widnes (B), 20 ; Swinton and Pendlebury, 15 ; Fleetwood, 14 ; Lancaster (B), 14 ; Eccles (B), 13 ; Farnworth, 12 ; Leigh (B), 10 ; Irlam, 10 ; Radcliffe, 10.

Appendix IV of this report shows the housing conditions of the patients in each dispensary area.

PROVISION OF BEDSTEADS, MATTRESSES, AND NURSING REQUISITES.

In each County dispensary area a small stock of bedsteads, mattresses (but not bedding), and nursing requisites belonging to the County Council is available for loan to necessitous patients undergoing home treatment.

The bedsteads and mattresses, which are held at the disposal of the consultant tuberculosis officers, have proved of valuable assistance in securing the better sleeping accommodation at home of persons with pulmonary tuberculosis considered to be infectious.

The table following shows the number of these articles owned by the County Council, and also the number of patients who have been granted the use of the articles :—

Table 22.

Articles.	Quantity owned by County Council, 31/12/29.	Number of patients to whom articles have been loaned during 1929.	Articles in possession of patients on 31/12/29.
Bedsteads	198	57	166
Mattresses	197	65	174
Mattress Covers	144	32	118
Air Beds	7	7	—
Air Cushions	163	173	72
Air Pillows	2	1	—
Air Pumps	2	1	—
Bath Chairs...	6	5	3
Bed Cradles	6	—	—
Bed Pans	112	78	46
Bed Rests	59	61	27
Bed Slippers	74	24	15
Extension Apparatus	14	1	—
Fracture Boards	2	1	—
Ground Sheets	42	6	15
Hot Water Bottles, Rubber ...	9	4	3
Ice Bags	2	—	—
Rest Chairs	3	1	1
Rubber Sheeting	18 yds.	3	1½ yds.
Rubber Sheets	7	2	2
Spinal Boxes	21	4	2
Spinal Carriages	16	8	1
Splints	15	2	2
Urinals...	109	54	41
Water Beds...	13	9	1

X-RAY WORK.

X-ray installations for use by the tuberculosis officers for the examination of patients are provided at the following dispensaries :—Lancaster, Darwen, Ashton-under-Lyne, Eccles and Seaforth ; also at the following sanatoria or hospitals :—High Carley, Elswick, Peel Hall, Rufford, and Withnell.

The following statement shows the X-ray work done during 1929, compared with previous years :—

Table 23.

	1923.	1924.	1925.	1926.	1927.	1928.	**1929.**
At County Dispensaries and Institutions :							
(*a*) Dispensary patients ...	2159	4045	3899	4440	5239	6191	5883
(*b*) Institutional patients...	193	160	205	351	617	1244	2160
At Manchester	82	24	11	—	—	—	—
Total	2434	4229	4115	4791	5856	7435	8043

The policy of placing an apparatus in each dispensary area for use by the tuberculosis officer himself is, from experience, found to be the best method, because the tuberculosis officer, with his knowledge of the patient's history and clinical signs, is most fitted to make a correct interpretation of the skiagrams.

EXAMINATION OF SPUTUM.

As an aid to diagnosis, arrangements are in existence for the examination, free of cost, of specimens of sputum sent by medical attendants. At each chief dispensary a small laboratory is installed for this work; whilst, in addition, an arrangement exists with the Director of the Public Health Laboratory, Manchester, for the examination of specimens including inoculation tests.

The following statement shows the results of the examinations made in 1929, compared with the previous year :—

	At Dispensary Laboratories.		At Public Health Laboratory, Manchester.	
	1928.	1929.	1928.	1929.
Positive (*i.e.*, tubercle bacilli present) ...	1,141	1,093	153	151
Negative (*i.e.*, tubercle bacilli not found).	4,519	4,529	341	373
Total	5,660	5,622	494	524

PROVISION OF SPECIAL NOURISHMENT.

During the year, 1,606 grants of special nourishment (subject to certain conditions, published in the 1924 report) for varying periods were made to 682 individual patients as part of their medical treatment. The figures in 1928 were 1,520 grants to 678 patients.

SPECIAL SURGICAL APPLIANCES.

During 1929 the following surgical appliances were supplied to patients on the recommendation of the tuberculosis officers :—

Abdominal belt, 3; abdominal frame, 6; ankle splint, 2; abduction splint, 1; artificial leg, 5; artificial foot, 1; artificial muscle, 1; back splint, 2; back support, 3; Bradford frame, 1; caliper splint, 16; cuirass, 5; cervical splint, 2; collar support, 1; crab splint, 2; crutches, 22 pairs; elbow splint, 1; hip splint, 14; hip shield, 1; knee splint, 12; leg splint, 3; leather jacket, 1; long Liston splint, 1; patten, 16; spinal support, 19; spinal collar, 1; spinal frame, 11; spinal jacket, 2; shoulder splint, 1; surgical boots, 23; Taylor's brace, 3.

SLEEPING SHELTERS.

There were, at the end of the year, 48 shelters in use by patients at their homes.

The loan of sleeping shelters is made to suitable cases on the recommendation of the tuberculosis officer, after careful consideration of the following points : (1) the condition of the patient and his ability to use the shelter properly ; (2) the position of the shelter ; (3) the home conditions of the patient ; and (4) the means of communication with the nearest inhabited building in case of a sudden relapse.

The number of persons in 1929 who were allowed the use of the shelters was 60.

I have to thank medical officers of health and sanitary inspectors throughout the County for much valuable help in connection with the removal, disinfection, and re-erection of shelters used by County patients.

X.—REPORT FOR DISPENSARY AREA No. 1.

(including Lancaster Pulmonary Hospital).

Area (estimated population, 261,465) embraces Lancaster, Chorley, Garstang Rural (part), Adlington, Horwich, Lytham St. Annes, Morecambe and Heysham, Preston Rural, etc.

Consultant Tuberculosis Officer ... ... Dr. A. D. Brunwin.
(Dr. Brunwin was also visiting physician to the Lancaster Pulmonary Hospital).

Assistant Tuberculosis Officer ... ... Dr. G. H. Leigh.

Dr. Brunwin reports :—

The new X-ray apparatus (a Newton and Wright set with a single rectifying tube) was installed at the Lancaster Dispensary during 1929. Metalix tubes are used, and much time is saved compared with the old apparatus. The X-ray plant has been an invaluable help in diagnosing.

During the year altogether 423 patients were referred to me by medical practitioners, school medical officers and others for an opinion as to diagnosis ; 240 of these, or 56 per cent., were found to be non-tuberculous.

Post-graduate courses have been attended by myself and assistant ; there is no doubt that these courses, not only in tuberculosis, but also in general medicine, are more than ever essential if we are to retain the confidence of the general practitioners.

Three voluntary care committees, namely, Lancaster and District, Chorley and District, and Horwich, are in existence in the area. The rural districts surrounding Preston have no care committee, and it is here that the County Care Fund is most helpful.

The visitation of the Heath Charnock Pulmonary Hospital has been continued by me as in past years. During 1929, by the rota, I also visited the East Lancashire Tuberculosis Colony, Barrowmore Hall. The institution appears to be an admirable one ; the industrial work done is most interesting and of great help to tuberculous patients. As the result of a discussion with the medical superintendent, arrangements were made for the treatment of several non-pulmonary cases not requiring splinting, and this accommodation has been useful owing to the great shortage of non-pulmonary beds for adults.

The loss of the accommodation at the Luneside Pulmonary Hospital has been acutely felt in the area ; in fact many patients in Lancaster and district have been deprived of pulmonary hospital treatment because if they go to a hospital thirty or more miles away they feel they are out of touch with their friends who cannot afford to visit them.

ARTIFICIAL LIGHT TREATMENT.

Artificial light centres have been established at the following tuberculosis dispensaries in Area No. 1 :—Lancaster (15th July, 1925), Chorley (14th October, 1926), and Preston (29th November, 1927).

At *Lancaster* the number of cases has declined to 9 at the end of 1929. Since the light centre was opened, altogether 41 cases have been written off as " quiescent and apparently cured." The small number of patients now requiring treatment has the effect of making the cost per patient appear fairly high, but this cannot be avoided, as among 9 patients treatment has to be more of an individual nature owing to the difficulty in grouping the various classes of patients—males, females, adults and children. Consequently much more of the time of the staff is taken up in giving treatment to the small number of patients than would otherwise appear.

At the *Preston* centre 51 different patients received treatment. The light sessions occupied two full days per week, and even then it was not always possible to give the patients as long an exposure as was necessary. The equipment is different from other centres in that the " Alpine Sun " carbon arc with four electrodes consuming 22 amperes is in use—the public supply of electricity would not permit of a lamp of higher amperage being installed. However, as soon as the public supply permits, I hope to requisition for the installation of " Sunrae " carbon arcs working on the stronger current of 30 amperes. This change, when effected, will, I hope, improve matters both for patients and staff and enable more decisive results to be obtained. In 1929, of the 51 patients treated, 18 were discharged " quiescent and apparently cured."

For the arc lamps I am still using carbons impregnated with iron. These enable shorter exposure to be given than with plain carbons. For the cases which are proving obstinate in response to light treatment, I am anxious to try longer exposures on three days per week instead of twice per week as at present. Cases requiring adjuvant treatment are not common in my area, but I do occasionally use acid nitrate of mercury, salicylic acid and Brookes' ointment.

Dr. Leigh, who is in charge of the light department at *Chorley*, reports as follows :—

The 75 different patients treated during the year included 17 suffering from tuberculosis of the skin, 22 from adenitis with abscess formation and skin involvement, 24 from adenitis without softening, and 3 from tuberculosis of the bones and joints. Most of the skin cases showed definite improvement, but there were some of old standing who, although benefiting to a large extent from light treatment, cannot at present be classified as " cured." Patients suffering from glandular tuberculosis, including those with suppuration and skin involvement, are in my experience specially suitable for light treatment. The patients made good progress and their general health improved. In a few instances patients who showed a tendency to relapse were given a further short period of treatment. For the three cases with tuberculosis of the bones and joints the results were good, especially in a case of disease of the ankle occurring in a patient past middle age.

The following Table 24 shows the results for patients treated at these dispensary centres during 1929 :—

(*a*) *Lancaster Centre.*

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	10	—	1	—	—	2	7
Adenitis with abscess formation and skin involvement	2	1	—	—	—	1	—
Adenitis without softening	4	1	—	—	—	2	1
Bones, joints and spine	2	—	—	—	—	1	1
Abdomen	2	1	—	—	—	1	—
Other non-pulmonary conditions ...	1	—	—	1	—	—	—
Pulmonary tuberculosis :— Bronchial glands	1	—	—	—	—	1	—
TOTAL	22	3	1	1	—	8	9

(*b*) *Preston Centre.*

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	13	3	1	—	—	1	8
Adenitis with abscess formation and skin involvement	17	8	1	—	—	—	8
Adenitis without softening	5	2	1	2	—	—	—
Bones, joints and spine	11	3	2	—	—	4	2
Abdomen	2	1	—	—	—	—	1
Other non-pulmonary conditions ...	1	1	—	—	—	—	—
Pulmonary tuberculosis :— Sputum positive	2	—	—	—	—	—	2
TOTAL	51	18	5	2	—	5	21

* Includes : (1) any patient who did not receive two months' treatment ; (2) patients ceasing light treatment prematurely (*e.g.*, removals, unwilling or unable to continue) ; and (3) patients transferred to sanatoria or hospitals.

(c) *Chorley Centre.*

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	17	2	4	—	—	2	9
Adenitis with abscess formation and skin involvement	22	5	3	—	—	1	13
Adenitis without softening	24	11	2	—	—	7	4
Bones, joints and spine	3	2	—	—	—	1	—
Abdomen	—	—	—	—	—	—	—
Other non-pulmonary conditions ...	8	5	1	—	—	1	1
Pulmonary and non-pulmonary combined :— T.B. minus and adenitis without softening	1	—	—	—	—	—	1
TOTAL	75	25	10	—	—	12	28

* For footnote, see foot of previous page.

LANCASTER PULMONARY HOSPITAL.

The Luneside Pulmonary Hospital belonging to the Lancaster Corporation, which accommodated some twenty patients from Area No. 1, was vacated on the 29th October, 1927, owing to flooding, and has not been in use since. Negotiations have been completed with the Lancaster Corporation for the erection of a tuberculosis block in the grounds of the new Corporation Fever Hospital, which will be built on the north-western boundary of the borough. The consultant tuberculosis officer for Area No. 1 will be the visiting physician of the tuberculosis block.

SUMMARY OF DISPENSARY WORK.

Number of tuberculous cases under supervision on 31st December, 1929 (Definitely tuberculous, 1092 ; doubtful, 1.) 1093

Examinations by Tuberculosis Officer at—	Examinations of *new persons* and *new contacts* for diagnosis.	Re-visits or re-attendances of "*old*" *cases* and "*old*" *contacts*.
Patients' homes	238	1405
Lancaster Chief Dispensary	97	412
Chorley Branch Dispensary	140	871
Preston Branch Dispensary	105	514
	342	1797

Attendances of patients at dispensaries for artificial light treatment—

Lancaster Dispensary	449	4869
Chorley Dispensary	2783	
Preston Dispensary	1637	

Care committee meetings attended by—		
(*a*) Tuberculosis officers		21
(*b*) Tuberculosis health visitors		34
Visits by tuberculosis officers to sanatoria, pulmonary and special hospitals		22
Special visits by tuberculosis officers (*i.e.*, interviews with medical officers of health, general hospital officials, &c.)		2
Visits by dispensary nurses to patients' homes—		
Routine visits	4030	4056
Actual nursing	20	
Application of surgical dressings	2	
Adjustment of splints and surgical appliances	4	
Sanitary defects reported to the local medical officers of health		21
Sanitary defects which after notification were remedied		8
Disinfections carried out by local sanitary authorities		220
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment		423

XI.—REPORT FOR DISPENSARY AREA No. 2.

(including Withnell Pulmonary Hospital).

Area (estimated population, 354,645) embraces Accrington, Bacup, Clitheroe, Colne, Darwen, Haslingden, Nelson, Rawtenstall, Turton, etc.

Consultant Tuberculosis Officer ... ... Dr. B. MacPhee.

(Dr. MacPhee is also visiting medical superintendent of the Withnell Pulmonary Hospital).

Assistant Tuberculosis Officers ... ... Dr. S. C. Adam and Dr. F. C. S. Bradbury.

Dr. MacPhee reports :—

Efforts continue to be made to obtain premises in Accrington more suitable for a chief dispensary. At present some of the work —more particularly the taking of skiagrams and the giving of refills in cases of artificial pneumothorax—is too much decentralised. This entails a waste of time and causes inconvenience to both patients and staff.

The X-ray work is done under constantly recurring difficulties at the dispensary in Darwen. The apparatus is of a pattern which is now out-of-date.

At the laboratory at Accrington (Chief) Dispensary, 1,084 specimens of sputum were examined during the year with the following results :—Positive, 207 ; negative, 877.

In order to assist in the diagnosis of difficult cases, 10 pathological specimens were sent to Manchester for inoculation tests, with the following results :—Positive, 1 ; negative, 9.

Quarterly visits were paid by Dr. Adam and myself to the Shropshire Orthopædic Hospital, Oswestry, under the very helpful scheme for the visitation of County patients undergoing treatment there.

Such places as the Burnley Pulmonary Hospital, the Moorlands Infirmary, Rawtenstall, and the Public Assistance Hospital at Burnley, were visited monthly, or as occasion suggested, in order to consult with the medical superintendents.

The care committee in the Bacup and Rawtenstall area, and that in the Bromley Cross district, have continued their useful work during the year.

Assistance to necessitous cases in those districts which do not possess a voluntary care committee has again been made possible through the medium of the County Care Fund, and during the year 69 individual patients, or their dependents, were assisted at a cost of £222 1s. 11d.

ARTIFICIAL LIGHT TREATMENT.

Artificial light centres have been established at the following tuberculosis dispensaries in Area No. 2 :—Stacksteads (9th January, 1928), and Nelson (20th November, 1928).

Stacksteads Centre. Ultra-violet irradiation treatment was commenced at the Stacksteads Dispensary at the beginning of 1928 with two types of lamps—Jesionek and Kromayer. Two of the former type were used to economise in time.

The following types of cases have been treated throughout the year :—lupus, tuberculosis of glands without suppuration, tuberculosis of glands with suppuration and discharging sinuses, and in some cases with skin involvement, tuberculosis of bone, abdomen, etc.

As before, the most marked success was seen in cases of lupus, and of chronic discharging sinuses with consequent debility in the patient. Six cases of lupus were taken off as quiescent during the year.

In very few patients has there been any marked increase in weight, although the general feeling of well-being has increased.

Generally speaking, patients have attended twice a week for ultra-violet irradiation, and up to 30 minutes' exposure has been given at a time.

Very little pigmentation was noticed in any of the cases, and in a large number none at all. Slight erythema was obtained in most, but this disappeared after a day or two.

The Kromayer lamp was used to supplement the Jesionek lamps in the treatment of lupus.

Nelson Centre. At this dispensary three types of lamps were installed at the end of 1928. In the main, however, only two were used, namely, the carbon arc and the Kromayer. The Jesionek was used only in a supplementary capacity. We were thus in a position to compare the effectiveness of the carbon arc with that of the Jesionek which was alone used for general irradiation at the Stacksteads Centre.

As far as can be judged from results in the treatment of lupus—and Dr. Adam is in agreement—there is little to choose between the two types. Patients treated by the carbon arc have, I understand, immediately after exposure, a greater sense of well-being, and in a given time more patients can be dealt with. But these are about the only advantages of the carbon arc over the Jesionek. During the greater part of the year the C type of carbon (strong) was used in the irradiation of adults and the "white-flame" (weak) in the case of children. In a few cases of adults 20 minutes' exposure was reached with the C type; with children and the "white-flame," up to half an hour. A deeper degree of pigmentation is obtained with the carbon arc than with the mercury vapour.

Ultra-violet irradiation in the treatment of tuberculosis must be judged by its effectiveness mainly in the cases of lupus. In my own experience I have been a little disappointed ; perhaps my expectations were too optimistic. Many patients benefited greatly, and at Stacksteads we were able to discharge several as cured. They were probably cases of a milder type, and after all it is only reasonable to assume that the virulence of tuberculosis in lupus varies in different individuals as it does in pulmonary and joint lesions. It should also be remembered that response to treatment in any disease varies in different individuals. Progress in a number of patients, after a certain state has been reached, is, however, slow. The rays appear to have a decided and an almost immediate health-giving effect on the older lesions and unhealthy scar tissue where the virulence of the process has apparently abated. Later, one is left with the " thin red line " of new and active tubercles, and here and there isolated active units in the scar tissue. The rapid progress formerly seen is definitely retarded or stopped, and in spite of persistent application of ultra-violet irradiation, more tubercles appear and the " line " advances. Other forms of treatment in these circumstances must be requisitioned.

No case of lupus was taken off as cured at the Nelson Dispensary, but, with one or two exceptions, all improved. Two cases of combined disease were treated by ultra-violet irradiation, but eventually the treatment was abandoned, in one case at the patient's own request, and in the other owing to the patient's condition becoming worse—not, however, necessarily due to the treatment.

The following Table 25 shows the results for patients treated at these dispensary centres during 1929 :—

(*a*) *Stacksteads Centre.*

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	19	6	—	1	—	2	10
Adenitis with abscess formation and skin involvement	14	10	—	—	—	1	3
Adenitis without softening	12	6	—	—	—	—	6
Bones, joints and spine	11	6	2	1	—	—	2
Abdomen	3	—	1	—	—	1	1
Other non-pulmonary conditions ...	4	2	—	—	—	—	
TOTAL	63	30	3	2	—	4	24

(*b*) *Nelson Centre* (*Opened 20th November, 1928.*)

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	18	—	—	1	—	—	17
Adenitis with abscess formation and skin involvement	7	1	—	—	—	—	6
Adenitis without softening	15	3	—	—	—	3	9
Bones, joints and spine	12	3	—	2	—	2	5
Abdomen	2	1	—	1	—	—	—
Other non-pulmonary conditions ...	1	1	—	—	—	—	—
Pulmonary tuberculosis :—							
Sputum positive	1	—	—	1	—	—	—
Sputum negative	1	—	—	—	—	—	1
Pulmonary and non-pulmonary combined :—							
T.B. plus and bones	1	—	—	—	—	1	—
T.B. plus and adenitis without softening	1	—	—	—	1	—	—
TOTAL	59	9	—	5	1	6	38

* Includes: (1) any patient who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (*e.g.*, removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

WITHNELL PULMONARY HOSPITAL, NEAR CHORLEY.

Matron: Miss D. Willman.

The County Council in December, 1924, purchased Withnell Hall (including two cottages, outbuildings, and 37 acres of land) situated on the main road from Blackburn to Chorley. The first patient was admitted on the 15th August, 1927. Accommodation is provided for 50 male patients (28 in cubicles, 16 in wards and 6 in shelters). The hospital serves mainly Dispensary Area No. 2. There are also on the estate three houses for employees.

Dr. MacPhee reports as follows :—

During the year, 99 patients were admitted, 65 were discharged, and 38 died. Included in the 99 admissions are 5 patients sent in for observation and treatment. The percentage of beds occupied during the year was 93·91.

At the institution's laboratory, 576 specimens of sputum were examined with the following results :—Positive, 326, negative, 250.

The X-ray apparatus has given constant and reliable service throughout the year. The number of skiagrams taken was 276, and screenings made, 209.

A commencement was made during the latter part of the year in the treatment of selected cases of pulmonary tuberculosis by artificial pneumothorax. Dr. Bradbury has more especially this work in hand, and I anticipate progress will be made during the coming year.

Two ultra-violet irradiation lamps were installed and used in the treatment of non-pulmonary lesions, on the whole with benefit.

Lipiodol, for diagnostic purposes, was introduced, and will no doubt prove of value in a few of the more abstruse cases where difficulties in diagnosis are presented.

The ordinary routine work of the institution calls for little comment. It has been carried on smoothly, and the behaviour of the patients under the very trying conditions of their disease has been exemplary. Not the least in importance in ensuring and maintaining the contentment of the patient is the provision of suitable work, exercise and entertainment.

With regard to the last-named, a Kodascope was provided by the assistance of the staff at the Nelson Dispensary and friends. The films, hired from the Kodak Company, and shown once a month, are greatly appreciated. The wireless facilities were also extended, so that now there is a wall plug with ear-phones to every bed. Many concerts were given by generous friends, by members of the staff, and by the patients themselves. I should like to express the appreciation of the patients and to thank those who came forward and gave of their time and talent. I would also mention with appreciation the assiduous work and interest taken by the matron and staff in the welfare of the patients, and also the willing and welcome help given by the staff of the chief dispensary at Accrington, and by certain members of the staff at the County Offices in Preston.

Special mention must be made of the work of Mr. Kelly, the joiner-instructor. It had been felt for some time that the patients' billiards and recreation rooms, situated in the administrative block and nurses' home, were not in the most advantageous position. The County Tuberculosis Committee granted permission and the necessary facilities for the erection of a wooden pavilion of such a size that it could be used as a general recreation room for billiards and also as a concert room. Mr. Kelly planned, and with the enthusiastic help of a number of the patients, built the pavilion at the north end of the bowling green. It is well lighted, ventilated, and heated by hot-water pipes. Running along the whole front is a wide well-covered verandah. The building reflects great credit on the workers. It was formally opened by Col. C. J. Trimble, C.B., the Chairman of the County Tuberculosis Committee on the 18th June, 1930, during a visit of inspection by the Committee and the Aldermen and Councillors of the Blackburn and Leyland Hundreds.

It is also my pleasure to be able to record the practical completion of the tennis court for the use of the members of the staff.

The flower beds, paths and grounds have had the constant attention of the gardener, and altogether the environment and amenities of the hospital have been greatly improved.

SUMMARY OF DISPENSARY WORK.

Number of tuberculous cases under supervision on 31st December, 1929 (Definitely tuberculous, 1092 ; doubtful, 11.)	1103

Examinations by Tuberculosis Officer at—	Examinations of *new persons* and *new contacts* for diagnosis.	Re-visits or re-attendances of " *old* " *cases* and " *old* " *contacts*.
Patients' homes	309	325
Accrington Chief Dispensary	257	558
Darwen Branch Dispensary	68	151
Nelson Branch Dispensary...	220	403
Stacksteads Branch Dispensary	97	295
	642	1407

Attendances of patients at dispensaries for artificial light treatment—		
Nelson Dispensary	2404	5120
Stacksteads Dispensary	2716	
Visits by tuberculosis officers to sanatoria, and pulmonary, special, and public assistance hospitals		40
Special visits by tuberculosis officers (*i.e.*, interviews with medical officers of health, general hospital officials, &c.)		10
Visits by dispensary nurses to patients' homes—		
Routine visits	6228	7131
Actual nursing	368	
Application of surgical dressings	151	
Adjustment of splints and surgical appliances	384	
Patients' dispensary attendances for attention by nurses—		
Application of surgical dressings	958	1309
Adjustment of splints and surgical appliances	351	
Sanitary defects reported to the local medical officers of health		39
Sanitary defects which after notification were remedied		35
Disinfections carried out by local sanitary authorities		1250
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment		747

XII.—REPORT FOR DISPENSARY AREA No. 3.

Area (estimated population, 375,658) embraces Ashton-under-Lyne, Bury Rural, Chadderton, Crompton, Heywood, Littleborough, Middleton, Mossley, Norden, Ramsbottom, etc.

Consultant Tuberculosis Officer ...	... Dr. G. FLETCHER.
Assistant Tuberculosis Officers ...	... Dr. C. BERRY and Dr. J. CATHCART.

Dr. Fletcher reports :—

During the meeting of the British Medical Association at Manchester, some members of the tuberculosis section visited the chief dispensary at Ashton-under-Lyne, where the methods of work were explained and a demonstration of X-ray films given.

In April, I assisted in giving evidence before the Silicosis (Medical Arrangements) Committee as to the incidence of silicosis in Lancashire and the methods of diagnosis available at our dispensaries.

The three voluntary care committees at Ashton-under-Lyne, Radcliffe, and Prestwich, have carried on their useful work. In all, they assisted 77 patients at a cost of £528 15s. 10d.

The County Care Fund, which covers the districts in which no voluntary committee operates, similarly expended £170 19s. 5d. in assisting 44 patients.

In connection with the Ashton-under-Lyne and District Care Committee, a memorial fund was opened to perpetuate the memory of the late Dr. J. Logan Stewart, whose devotion to his patients will long be remembered with gratitude in this area. It is hoped that this fund, together with the legacy left to the Care Committee by Dr. Stewart himself, will form a substantial and permanent source of help for the patients in the Ashton-under-Lyne district.

At the chief dispensary at Ashton-under-Lyne, 2,169 skiagrams were taken, compared with 2,259 in 1928. Prints were made of the more interesting conditions, and in special cases were sent to the practitioner in charge.

A series of lantern slides illustrative of various tuberculous and pseudo-tuberculous conditions was supplied to the Medical Faculty of Manchester University for teaching purposes.

Sputum examinations at Ashton-under-Lyne Dispensary numbered 1,392. Of these, 374 were positive, and 1,018 were negative.

Wasserman reactions and inoculation tests were carried out at the Public Health Laboratory, Manchester.

Lectures were given by me to the North-Western Tuberculosis Society, and during the health weeks at Prestwich and Milnrow.

A section on tuberculosis formed part of the health week exhibition at Middleton.

Monthly visits were paid to Aitken Sanatorium, and to Chadderton, Wolstenholme Hall, Marland, and Westhulme Pulmonary Hospitals, for the purpose of consultation with the medical superintendents. The orthopædic institutions at Leasowe, Heswall and Thingwall were similarly visited every quarter.

I am indebted to my colleagues of the medical, clerical and nursing staffs for their loyal assistance during the year, and to the practitioners of the area for their cordial co-operation in the work.

ARTIFICIAL LIGHT TREATMENT.

Artificial light centres have been established at the following tuberculosis dispensaries in Area No. 3: Ashton-under-Lyne (11th September, 1925), and Radcliffe (20th July, 1928).

During the year no change was made in the staff or equipment of the light centres at Ashton-under-Lyne or Radcliffe. Treatment was restricted to those types of cases which experience has shown to be most amenable to light therapy. These include tuberculosis of the skin, glands, peritoneum, and the smaller bones and joints.

Lung cases with active signs were excluded. In this connection it is noteworthy that three cases under light treatment developed active lung symptoms and signs, with a positive sputum in two instances. Two of these, in addition to non-pulmonary lesions, had quiescent lung disease with no active symptoms and no sputum at the commencement of their light treatment. The other, a case of glandular disease, had no symptoms, signs, or X-ray evidence of lung development at the beginning of his light course. In all three cases light treatment was stopped, and the patient referred to sanatorium.

In addition to light treatment, various ancillary methods were employed, such as incision and aspiration of abscesses, the application of various caustics, and the administration of tuberculin and other vaccines. Such measures seemed definitely to hasten the improvement or cure in a certain number of cases.

Patients with arrested or cured disease continue to attend the dispensary at intervals for observation, so that a further course of treatment may be instituted if this is thought desirable. Thus, 161 quiescent and apparently cured cases attended at Ashton-under-Lyne during the year for observation, while 27 convalescent and quiescent cases received a prophylactic course of light. There were four cases of relapse. Two of these were suffering from cervical adenitis with abscess, one from cervical adenitis without abscess, and one from tuberculosis of the foot bones. These cases were given a further course of light treatment with satisfactory results.

At the *Radcliffe* light centre, 9 quiescent cases were kept under observation, while 4 convalescent and quiescent cases received a prophylactic course of light treatment. There were two instances of relapse in patients in whom the disease had been previously arrested. Of these one was a case of lupus, and the other a case of adenitis with abscess formation. In these cases also light treatment was renewed with good results.

The following Table 26 shows the results for patients treated at these centres during 1929 :—

(*a*) *Ashton-under-Lyne Centre.*

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	33	5	—	—	—	8	20
Adenitis with abscess formation and skin involvement	36	8	—	—	—	2	26
Adenitis without softening	29	7	—	—	—	7	15
Bones, joints and spine	28	5	—	—	—	8	15
Abdomen	14	2	—	—	1	2	9
Other non-pulmonary conditions ...	3	—	—	—	—	1	2
Pulmonary tuberculosis :—							
Sputum negative	1	—	—	—	—	—	1
Bronchial glands	2	—	—	—	—	1	1
Pleura	2	—	—	—	—	—	2
Pulmonary and non-pulmonary combined :—							
† T.B. plus and tongue	1	—	—	—	—	1	—
† T.B. plus and adenitis with abscess formation	1	1	—	—	—	—	—
T.B. minus and knee	1	—	—	—	—	1	—
T.B. minus and abdomen ...	1	—	—	—	—	1	—
TOTAL	152	28	—	—	1	32	91

(*b*) *Radcliffe Centre.*

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	14	2	—	—	—	—	12
Adenitis with abscess formation and skin involvement	18	7	—	—	—	5	6
Adenitis without softening	8	3	—	—	—	—	5
Bones, joints and spine	5	—	—	—	—	2	3
Abdomen	3	—	—	—	—	1	2
Other non-pulmonary conditions ...	3	—	—	—	—	—	3
TOTAL	51	12	—	—	—	8	31

* Includes: (1) any patient who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (*e.g.*, removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

† Local treatment only for non-pulmonary condition.

Summary of Dispensary Work.

Number of tuberculous cases under supervision on 31st December, 1929 (Definitely tuberculous, 1737 ; doubtful, 0.) 1737

Examinations by Tuberculosis Officer at—	Examinations of *new persons* and *new contacts* for diagnosis.	Re-visits or re-attendances of "*old*" *cases* and "*old*" *contacts*.
Patients' homes	154	392
Ashton-under-Lyne Chief Dispensary ...	532	2378
Middleton Branch Dispensary	83	346
Mossley Branch Dispensary	43	193
Oldham Branch Dispensary	304	1259
Radcliffe Branch Dispensary	207	805
Rochdale Branch Dispensary	164	583
	1333	5564

Attendances of patients at dispensaries for artificial light treatment—		
Ashton-under-Lyne Dispensary	9164	11548
Radcliffe Dispensary	2384	
Care committee meetings attended by—		
(*a*) Tuberculosis officers		7
(*b*) Tuberculosis health visitors		8
Lectures or addresses given		2
Visits by tuberculosis officers to sanatoria, and pulmonary, special, and public assistance hospitals		81
Special visits by tuberculosis officers (*i.e.*, interviews with medical officers of health, general hospital officials, &c.)		2
Visits by dispensary nurses to patients' homes—		
Routine visits	8103	9130
Actual nursing	475	
Application of surgical dressings	22	
Adjustment of splints and surgical appliances	530	
Patients' dispensary attendances for attention by nurses—		
Application of surgical dressings	88	164
Adjustment of splints and surgical appliances	76	
Sanitary defects reported to the local medical officers of health		74
Sanitary defects which after notification were remedied		33
Disinfections carried out by local sanitary authorities		368
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment ...		842

XIII.—REPORT FOR DISPENSARY AREA No. 4.
(including Peel Hall Pulmonary Hospital).

Area (estimated population, 344,774) embraces Leigh, Eccles, Atherton, Farnworth, Stretford, Swinton, Westhoughton, Barton Rural, etc.

Consultant Tuberculosis Officer ... Dr. G. Jessel.
(Dr. Jessel is also visiting medical superintendent of Peel Hall Pulmonary Hospital).
Assistant Tuberculosis Officers ... Dr. A. B. Jamieson and
Dr. H. J. Villiers.

Dr. Jessel reports :—

Dispensary work is mainly concerned with persons: (1) the detection of definite cases of tuberculosis at as early a stage as possible, (2) all that appertains to the treatment and welfare of the patient and his family so far as circumstances permit.

The accurate diagnosis of cases of tuberculosis, whether formally notified or not, is a primary essential, and in 1929, 683 cases were specially referred to me by their medical attendants, representing 85 per cent. of the total number (799) of new cases, excluding contacts, examined during the year. Most of these attended one of the five dispensaries, but 180 had to be visited at home. Of these visits 155 were paid by me personally, and in 88 per cent. of the cases the doctor was present with me at the time of examination.

Accurate *diagnosis* depends upon the careful appraisement of a number of factors, based upon judgment and experience. These imponderables cannot be measured by statistics, but some idea of the activities of the dispensary in this connection may be gained from the following figures :—

(*a*) Sputum Examinations. At the Eccles Dispensary 1,858 specimens were examined, and of these 270 contained tubercle bacilli. Medical practitioners sent 322, and tubercle bacilli were found in 43 of these. Thus, the bulk of the examinations were done as part of a general overhaul of patients. The examination of sputum alone, if the result is negative, is apt to lead to a false sense of security, and not infrequently postpones the diagnosis of definite cases.

(*b*) X-ray Examinations. Last year 965 skiagrams were taken as follows :—Chest, 881 ; spine, 23 ; hip, 17 ; knee, 18 ; ankle, 11 ; shoulder, 4 ; elbow, 3 ; wrist and hand, 5 ; others, 3. These skiagrams provide a permanent visible record, and when interpreted rightly are of particular value in doubtful or disputed cases. They are especially useful in differential diagnosis. A tuberculosis officer sees far more non-tuberculous cases than tuberculous, and there are few diseases of the chest not included in our collection of skiagrams.

A definite diagnosis of tuberculosis is usually reached within a fortnight, and then arrangements are made for the treatment of the patient at a suitable institution, his own home, or the dispensary, having regard to the whole of the medical and family circumstances. In this connection the dispensary nurses render valuable help in the supervision of the patients' home routine of life, and in such actual nursing of patients as may be required.

A case of interlobar mediastinal pleurisy will serve as a useful example of the value of X-rays in establishing the diagnosis, which in this instance was not one of tuberculosis. The case is illustrated by the X-ray photograph here reproduced, below which is given the history, symptoms, and physical signs of the patient, together with the X-ray findings.

An important branch of the dispensary activities is *care work.* Last year the care committees of Leigh, Farnworth, and Westhoughton, together with the tuberculosis sections of the Eccles and Stretford Guilds of Help, assisted 148 patients at a cost of £414 13s. 6d. In addition, 13 other patients, residing where no voluntary care organisations exist, were assisted at a cost of £21 7s. 6d. direct from the County Care Fund.

In the effort to detect early cases 257 selected contacts (suspected cases of tuberculosis) were examined, and 5 definite cases found.

The institution of artificial pneumothorax as a recognised method of treatment in suitable cases at the Peel Hall Pulmonary Hospital (see special report) and elsewhere has resulted in the necessity for refills when patients have been discharged. Five such cases were dealt with at the Eccles Dispensary last year under X-ray control.

An outstanding feature of the year was the inclusion of the Eccles Dispensary in the list of tuberculosis institutions visited during the meetings of the British Medical Association at Manchester, and a number of distinguished physicians attended on July 24th, when a demonstration of skiagrams and light treatment was given.

Two lectures, illustrated by skiagrams, on the diagnosis and treatment of pulmonary tuberculosis, were given by me at the Manchester Royal Infirmary on October 18th and 25th as part of a course of post-graduate lectures on various medical subjects given there during the autumn.

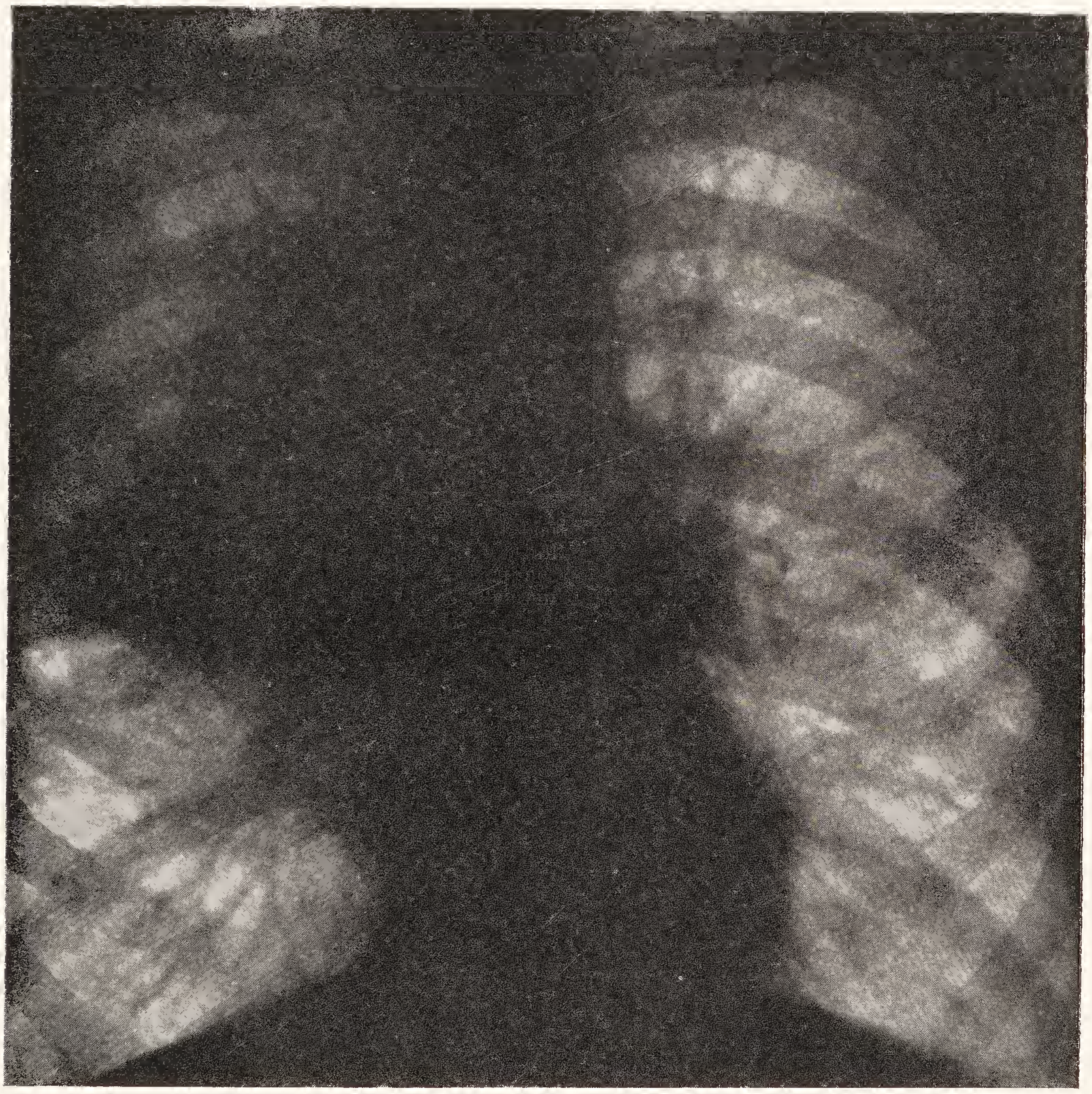
In conclusion, I am as usual indebted to the whole dispensary staff for the smooth and efficient working of the dispensary organisation of the area.

ARTIFICIAL LIGHT TREATMENT.

The artificial light centre at the Eccles Dispensary was established on the 1st December, 1927.

Last year I described in detail the methods in use at the Eccles Dispensary. They are, briefly, as follows : (1) With the two 30 ampere

SKIAGRAM ILLUSTRATING THE VALUE OF X-RAYS FOR DIAGNOSIS.



Patient T.L.B., aged 44, a bolt maker, was referred to the dispensary by his panel doctor. He had been ailing for eighteen months, but had kept at work until three weeks previously. His chief symptoms were cough, expectoration, and loss of weight. On clinical examination the man was thin, weighing 7st. 13½ lbs. Myoidema present. On percussion definite dulness right mammary region. Tachycardia; no other definite physical signs. Sputum was mucopurulent and no tubercle bacilli were detected in six specimens sent. X-ray examination at Eccles Dispensary showed in the middle zone of the right lung a conical opacity with apex outwards and base at hilum and some enlargement of right mediastinum. Rest of lungs apparently free from disease. Diagnosis: interlobar mediastinal pleurisy. Patient died suddenly a week later; no post-mortem.

[*Skiagram taken at Eccles Dispensary.*]

carbon arc lamps Siemens' "Snow-white" brand carbons were used. Exposure with patients at three feet distance began at fifteen minutes back and fifteen minutes front, increasing by fifteen minutes each way to a maximum of seventy-five minutes back and front; (2) with the Jesionek mercury vapour lamp the initial exposures at three feet distance were one minute back and front, increasing weekly by one minute to a maximum of ten minutes each way; (3) local applications with the Kromayer lamp five minutes or longer to obtain a blister.

This procedure, having been found successful, has been continued. There is reason to believe that the hyperæmia of the skin resulting from prolonged exposure to the warmth of the lamps is itself beneficial, while free circulation of air is maintained by cross ventilation aided by an electric fan. In certain gland cases local exposures of glands to the Jesionek lamp have been given with apparent benefit to patients on the full carbon arc dose. No unfavourable effects of any kind have been experienced, and the methods outlined above have the advantage of requiring a minimum of expert medical supervision.

On 31st December, 1928, 73 patients were under treatment. During 1929, 77 patients began treatment, and 55 were discharged as quiescent, 2 others being discharged improved and 2 stationary; 31 cases ceased attendance for various reasons, leaving 60 under treatment at the end of 1929.

As in previous years attention has been focussed upon cases likely to respond favourably (*i.e.*, lupus and scrofulo-derma, and adenitis with and without sinuses), but a few cases of bone and joint disease and peritonitis were also successfully treated.

The response to light treatment has been found to vary in different persons, the most intractable being perhaps those who have had previous treatments, especially with X-rays. Of the quiescent lupus cases the average duration of disease prior to treatment was in 7 children over 6 years, and in 16 adults nearly 18 years. Similarly, in the adenitis cases without softening the average duration both in adults and children was over 3 years. In these cases the glands frequently became small, hard and apparently calcified. As regards weight, of 55 quiescent cases, 41 gained an average of about 6½ lbs., 11 lost weight, and in 3 the weight remained stationary. Similarly these 55 patients pigmented as follows: deep, 34; medium, 18; slight, 1; none, 2 (no general irradiation). Although pigmentation may be an indication of tendency towards improvement, being the local response of the skin to the ultra-violet rays, these cannot penetrate the pigmented skin, and on this account I think that early deep pigmentation is undesirable.

Five cases of lupus, in which relapses occurred, received further treatment.

Most of the patients attended thrice weekly, but a few men while working attended a weekly evening session only, and in these cases progress was slower. Three-fourths of the patients were able to continue their normal occupations during treatment, and on the whole regular attendances were most praiseworthy, involving, as they did, a sacrifice of time and energy on the part of the patients or their mothers. If light treatment is to give the best results it should be supplemented by such other methods as appear necessary, *e.g.*, aspiration of abscesses, division of keloid bands, etc. In certain cases of thick, warty lupus, a preliminary energetic treatment with creosote and salicylic plaster has proved very useful, and in a few cases isolated nodules have been successfully treated with other local applications.

The success of light treatment depends largely upon a careful and painstaking attention to detail over a long period, and in this connection I have received valuable help from Miss Shakespeare, the nurse-in-charge.

The following Table 27 shows the results for patients treated during 1929:—

Eccles Centre.

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	68	23	2	—	—	11	32
Adenitis with abscess formation and and skin involvement	47	19	—	—	—	7	21
Adenitis without softening	18	5	—	—	—	8	5
Bones, joints and spine	12	4	—	2	—	4	2
Abdomen	3	3	—	—	—	—	—
Other non-pulmonary conditions ...	2	1	—	—	—	1	—
TOTAL	150	55	2	2	—	31	60

* Includes: (1) any patient who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (*e.g.*, removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

PEEL HALL PULMONARY HOSPITAL, LITTLE HULTON.

Matron: Miss A. Jones.

The Hall, with about 17 acres of land attached thereto, was presented in 1914 to the Lancashire County Council by Mr. A. Wynne-Corrie, and an additional 20 acres of land, and later 8 acres, have been purchased. The adaptation of the premises as a pulmonary hospital for the treatment of advanced and chronic cases suffering from tuberculosis—delayed owing to the Great War—was completed in 1921.

The accommodation has been increased from 46 to 55, all adult males, by the provision of sleeping shelters. The hospital serves principally Dispensary Area No. 4 in taking advanced, observation, and educational cases.

A motor ambulance is provided, and is available also for conveying patients to and from other hospitals.

Dr. Jessel reports as follows on the year's work at the hospital :—

The special characteristics of the institution are :—

The patients, mainly drawn from the area in which the hospital is situated, come under the purview of the medical officer both before and after treatment. Being familiar with their domestic circumstances, he is in a position to decide the appropriate treatment in each case both as regards character and duration. The average length of stay of 92 definite cases discharged during 1929 was 181 days, and no patient left without permission.

Sanatorium methods, adapted to the requirements of chronic and advanced cases, are employed, and a considered and closely supervised scheme of purposeful occupation therapy for patients up and about is in operation.

Specialised individual methods of diagnosis and treatment, including Lipiodol, artificial pneumothorax, Sanocrysin, etc., are in regular use.

The reasons for admission to the hospital are :—(1) To improve the health of the patients ; (2) to provide nursing for acute cases such as would be impossible at home ; (3) to minimise the risks of spread of the disease in the home in certain cases, especially where there are young children and accommodation is restricted ; and (4) to establish a diagnosis in doubtful cases. (During the year 8 observation cases were admitted).

The average length of stay until death of 38 very advanced cases, whose home circumstances were unsatisfactory, was 100 days. In spite of the fact that early cases are seldom met with in the hospital, a large proportion of the patients do remarkably well.

The amenities of the hospital are such as can scarcely fail to react favourably upon the patients. There are ample opportunities for indoor and outdoor recreation, including a large library, billiards-table, gramophones, wireless and recently a Kodascope. In summer there are bowls, croquet, clock-golf, etc.

The establishment of a patients' social club, officered and managed by the patients themselves, has been a great success in every way, and as usual *Our Mag*—the patients' literary effort—made its welcome appearance at Christmas.

An integral part of the hospital routine is the scheme of purposeful occupation therapy for patients able to be up. Due consideration is given to the tastes and abilities of the patients. The occupations are such as men might reasonably desire to carry out in their own homes, and include various types of gardening, painting, window-cleaning, boot repairing, woodwork (including chopping firewood and simple joinery work), miscellaneous repairs and odd jobs with the engineer, chauffeur, poultry man, etc.

In addition there are patient-stewards for the library, and the various social activities.

The daily visits of the medical officer or an assistant, and the close personal touch thereby obtainable with a number of men sufficiently small for individual attention ensure that a cheerful healthy tone generally prevails.

Special methods of diagnosis and treatment. The provision of an up-to-date X-ray apparatus has rendered possible the use of specialised methods hitherto unattainable, and 372 skiagrams were taken during the year. On admission a skiagram is taken of each patient and individual consideration is given to his special requirements.

Eight patients were admitted for diagnosis, and in six of them Lipiodol proved invaluable.

A number of patients respond satisfactorily to strict bed-rest under sanatorium conditions, but in other cases additional methods are tried. The special methods employed have been artificial pneumothorax and Sanocrysin (see special reports on pages 25 and 9). In a hospital of 55 beds the number of patients suitable for any special treatment must necessarily be limited. During 1929 artificial pneumothorax was successfully induced in 14 patients, and 19 patients received a full course of Sanocrysin treatment. The results of both these treatments have been encouraging.

To sum up, the characteristic features of the hospital are the combination in one unit of sanatorium treatment and occupation—therapy adapted to chronic and advanced cases with special treatments (apart from major surgery) as are practised at chest hospitals. The fact that the medical officer is also tuberculosis officer of the area in which most of the patients reside, ensures that their treatment is based upon a knowledge of the medical and environmental aspects of each case, and that on discharge from the hospital continuity of treatment is assured.

During the meetings of the British Medical Association at Manchester in July, a party of tuberculosis physicians visited the hospital, while earlier in the year we were honoured by a visit from Sir Farquhar Buzzard (Regius Professor of Medicine at Oxford, and Hon. Physician to H.M. the King).

It remains to add that the whole resident staff, headed by the matron, have done everything possible to make the patients happy and comfortable. I am likewise indebted to my assistants, Drs. Jamieson and Villiers, for help in the laboratory and X-ray rooms, and especially to Sister Pegg, upon whom, as a result of the introduction of special methods of treatment, much additional responsibility has devolved.

SUMMARY OF DISPENSARY WORK.

Number of tuberculous cases under supervision on 31st December, 1929 (Definitely tuberculous, 1681 ; doubtful, 0.)	1681

Examinations by Tuberculosis Officer at—	Examinations of *new persons* and *new contacts* for diagnosis.	Re-visits or re-attendances of " *old* " *cases* and " *old* " contacts.
Patients' homes	349	942
Leigh Chief Dispensary	231	1117
Eccles Branch Dispensary	144	1032
Farnworth Branch Dispensary	113	588
Pendlebury Branch Dispensary	99	514
Stretford Branch Dispensary	120	737
	707	3988

Attendances of patients at the Eccles Dispensary for artificial light treatment		6337
Care committee meetings attended by—		
(*a*) Tuberculosis officers		40
(*b*) Tuberculosis health visitors		66
Lectures or addresses given		4
Visits by tuberculosis officers to sanatoria, and pulmonary, special, and public assistance hospitals		43
Special visits by tuberculosis officers (*i.e.*, interviews with medical officers of health, general hospital officials, &c.)		41
Visits by dispensary nurses to patients' homes—		
Routine visits	9164	10927
Actual nursing	276	
Application of surgical dressings	1029	
Adjustment of splints and surgical appliances	458	
Patients' dispensary attendances for attention by nurses—		
Application of surgical dressings	1310	1328
Adjustment of splints and surgical appliances	18	
Sanitary defects reported to the local medical officers of health		35
Sanitary defects which after notification were remedied		24
Disinfections carried out by local sanitary authorities		424
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment		683

XIV.—REPORT FOR DISPENSARY AREA No. 5.

(including Rufford Pulmonary Hospital).

Area (estimated population, 374,567) embraces Hindley, Ince, Litherland, Newton-in-Makerfield, Widnes, Warrington Rural, Seaforth, West Lancashire Rural, Whiston Rural, Wigan Rural, etc.

Consultant Tuberculosis Officer ... Dr. C. W. Laird.

(Dr. Laird is also visiting medical superintendent of the Rufford Pulmonary Hospital).

Assistant Tuberculosis Officers ... Dr. C. H. Lilley and
Dr. G. Barker Charnock.

Dr. Laird reports :—

As has been usual in former years, the duties imposed on the dispensary staff have progressively increased in association with the general increase in the scope of the work. No falling off in the number of cases examined at the dispensaries, and in many instances X-rayed later at the chief dispensary, is observable.

The use of X-rays has extended considerably with the additional numbers coming to the dispensary for refills in connection with artificial pneumothorax treatment and also in determining diagnosis or recording progress under treatment.

During the year light treatment was given for the first time at Wigan Dispensary, which is under the immediate supervision of the assistant tuberculosis officer for that district. It is also given as before at St. Helens Dispensary, where patients are similarly supervised. The opening of the light centre at Wigan was instrumental in relieving congestion at St. Helens by meeting the demands from the districts surrounding the borough, and incidentally promoting the convenience of patients and effecting reduction in the payment of travelling expenses.

Of the total care committees in the County area, six (or nearly one-third) are concerned with parts of Area 5. These committees have continued to do praiseworthy work and acknowledgment is here made of the voluntary services performed by their members.

During the year 779 skiagrams were taken, and 971 sputum examinations were made at Seaforth Dispensary.

It is to be borne in mind that the work of the area is closely associated with the pulmonary hospital treatment which is afforded at Rufford Hospital where the majority of beds are filled by patients from the area itself, and where the medical superintendent is consultant for the area. This enables one to keep in close touch with progress of cases and enables treatment and after-care to be correlated in a most satisfactory manner. Prior to patients' admission to hospital the dispensary is a centre for diagnosis and advice, and after discharge they are again under supervision at the dispensary.

ARTIFICIAL LIGHT TREATMENT.

Artificial light centres have been established at the following tuberculosis dispensaries in Area No. 5: St. Helens (16th January, 1928), and Wigan (31st May, 1929).

St. Helens Centre. The majority of the patients suffer from lupus and tuberculous adenitis, but there are also a few cases of bony tuberculosis under treatment. Pulmonary cases, unless slight and with negative sputum, are not placed on light treatment.

The lamp equipment consists of two 30 ampere carbon arc " Sunrae " lamps and one Kromayer lamp. Grade A " Sunic " carbons are used during the initial stage of treatment until the exposures become prolonged, when they are replaced by grade C (or iron impregnated) carbons, permitting a much reduced exposure owing to their greater intensity. The exposures with grade A carbons are 7½ minutes back and 7½ minutes front, to a maximum of 20 minutes back and 20 minutes front, and with grade C carbons 5 minutes back and 5 minutes front, increasing to 12 minutes back and 12 minutes front.

In some cases the value of the irradiation appears to have been enhanced after a preliminary staining of the skin with a solution of eosin.

Wigan Centre. The following notes have been compiled by Dr. Charnock, who supervises the treatment at this centre :—

The centre serves a population of 127,000. The lamp equipment consists of the following :—2 carbon arcs, " Sunrae " pattern ; 1 Jesionek mercury vapour lamp ; and 1 Kromayer mercury vapour lamp, with self-contained water apparatus.

Before deciding as to the suitability of any particular case for radiation, a careful physical examination is made. A skiagram of the chest is taken as a routine, and the urine is carefully examined. Cases with any septic lesions of nose, throat, or ears, are advised to have treatment for these lesions. Patients with coughs are not exposed to the light rays. Photographic records are taken as a routine, and at intervals of three months. Patients are weighed without clothes once a week, and are encouraged to bathe daily. Temperatures are recorded before and after radiation. The temperature of the light room is kept as near 70 degrees as possible. Light baths are given twice a week with local applications once a week. Sheet celastoid masks, either green or red, are provided for each patient.

General radiation of the whole body has been employed with the carbon arc and Jesionek mercury vapour lamps, the initial doses being one minute each, front and back, working up gradually to 16 minutes. Grade C (iron impregnated) carbons have been used throughout in the arc lamps. Each patient has been radiated to the limit of his tolerance, and each has received individual care, attention, and study. In addition to the general baths, local application of the same lamps has been given by allowing the patient to dress, and then covering up all exposed skin except that of the lesion. This has been done at each session.

The Kromayer burner has been used for small local lesions, the initial dose being for one minute, rapidly working up to six minutes in some cases. The aim has been to obtain an acute local reaction with blister formation which clears up within the week, so that a dose can be given every seven days. The length of exposure naturally depends upon the individual treated.

It has been noted how much keener is the reaction on cold and frosty mornings. This fact has necessitated a readjustment of exposures in certain susceptible patients.

The chief difficulty met with in the lesions has been the warty tubercle, and areas with thick keratinous keloid-like excrescences. These lesions, being so fibroid, are very resistant to the penetration of the rays and the local reaction on account of the poor blood supply is very difficult to obtain. It is in these cases that other methods have been employed as an adjuvant. Variations in reactions and in subsequent progress have been noticed in the same lesions, those parts where the skin was thin healing more rapidly than the more keratinous areas.

It is in horny lesions that it has been found helpful to resort to adjuvant methods. The following have been used with success :—(*a*) paring with scalpel ; (*b*) curetting with fine curette under borocaine anæsthesia ; (*c*) application of trinitro phenyl cupri zinci sulphate ; (*d*) cauterising with cupri sulphas ; (*e*) application of anhydrous glycerol ; and (*f*) application of Brookes' ointment. Of the foregoing perhaps the most useful has been trinitro phenyl cupri zinci sulphate, which breaks down the horny matter and dissolves it. The thickness of the skin is reduced, thus bringing the underlying tubercle within the scope of the rays. The results of experiments with anhydrous glycerol have been interesting. After a week's application to the papillomatous lesion the papillæ swell rapidly to twice their original size and become more cauliflower-like. On removing the swollen mass, which peels off quite easily, it is found to leave a dry bloodless corky area, which, in its turn, swells up on further application, and a further layer can be removed. This goes on until the wart disappears. The tubercle is then exposed and begins to react to the ultra-violet light.

Experiments on cases of nasal septal tuberculosis have been made with adrephine, which is a preparation containing ephedrine sulphate, adrenalin, and chloretone. It was hoped that this astringent preparation applied for five minutes to the nasal mucosa would reduce the surface blood, and so allow a further penetration of the rays. Two cases which have been so treated have lost their soreness and sepsis.

General Conclusions: The following observations have been recorded :—(1) the increased mental and bodily vigour of patients under treatment; (2) the rapid removal of sepsis; (3) the localising of actual tuberculous foci in a heterogeneous mass of pathological tissue. The disease, instead of being general over a part, is seen to be localised in more or less discrete areas; and (4) a very important result, and one which does not appear with any other kind of treatment with perhaps the exception of diathermy, is the remarkable suppleness of the scar left after ultra-violet ray therapy.

The treatment is slow, but much depends upon interest and keenness in the work, in paying special attention to individual cases, and in obtaining the confidence and co-operation of the patient particularly in regard to his regular attendance.

The following Table 28 shows the results for patients treated at these centres during 1929:—

(*a*) *St. Helens Centre.*

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	44	10	3	—	—	7	24
Adenitis with abscess formation and skin involvement	22	13	—	—	—	1	8
Adenitis without softening	22	10	4	—	—	2	6
Bones, joints and spine	5	2	—	—	—	1	2
Abdomen	9	2	—	1	—	1	5
Other non-pulmonary conditions ...	2	—	—	—	—	1	1
TOTAL	104	37	7	1	—	13	46

(*b*) *Wigan Centre* (*Opened May 1929*).

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	26	4	—	—	—	1	21
Adenitis with abscess formation and skin involvement	8	3	—	—	—	2	3
Adenitis without softening	3	—	—	—	—	1	2
Bones, joints and spine	2	—	—	—	—	1	1
Abdomen	3	2	—	—	—	—	1
Other non-pulmonary conditions ...	2	—	—	—	—	—	2
Pulmonary and non-pulmonary combined:—							
T.B. plus and scrofulo-derma ...	1	—	—	—	—	1	—
TOTAL	45	9	—	—	—	6	30

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* Includes: (1) any patient who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (*e.g.*, removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

RUFFORD PULMONARY HOSPITAL, NEAR ORMSKIRK.

Matron: Miss E. Moseley.

The County Council acquired, on the 18th October, 1920, Rufford New Hall, situated on the west side of the main road from Preston to Ormskirk, together with 128 acres of land adjoining the Hall. Under pressure from the Ministry of Health, a scheme was prepared for using the Hall and land for discharged sailors and soldiers, and the scheme included training the patients in several occupations. Some additional land was also obtained with a view to training in agricultural work, but all this, however, was abandoned in 1921 by order of the Ministry of Health, owing to financial stringency. The premises were first used as a pulmonary hospital on the 7th April, 1926, providing accommodation for 52 female patients.

The hospital serves as far as possible the districts in West Lancashire, so that relatives and friends will have reasonable facilities for visiting.

A motor ambulance has been provided, available for the hospital and also for conveying County patients to other hospitals—often involving journeys of 100 miles.

Dr. Laird reports as follows on matters relating to the treatment of patients and the administration of the hospital :—

During 1929 the number of patients admitted was 98. Of those undergoing treatment, 89 were discharged and 7 died. To some these figures may be a matter for surprise, and it is well, perhaps, to remind critics of some important points. In the first place, the institution is not in the strict sense a pulmonary hospital ; it is to some extent a non-pulmonary hospital as well, and as a rule nearly a third of its beds are filled by cases of so-called " surgical tuberculosis " pure and simple, or cases in which the " surgical " or non-pulmonary condition is the predominant one. Many of these are cases of severe spinal disease, requiring long periods of recumbency, and not a few need, in addition, daily surgical dressing and constant nursing attention while they are absolutely confined to bed. In the wards upstairs there are some 36 sputum-positive cases in various stages of the disease. Most of these are fairly advanced, and a goodly proportion are unable to be out of bed. Downstairs are the " surgical " cases already referred to, and a few sputum-negative and observation cases also. Those who expect sensational returns, therefore, may be disappointed. If the number admitted appears small, it is to be remembered that it depends on the number of patients who have been discharged or who have died, as the total number of beds available is 52, and only female patients are taken. If the deaths have been few, it is partly owing to the fact that several patients have been allowed, at their own request or that of their relatives, to return home when they had but a few days or so to live. That, incidentally, is a practice to which some exception may be taken, if the view is held that infective patients should be kept in hospital isolation until they die, rather than be allowed to spread infection in their homes. It may be said at once that the home circumstances always receive due consideration, but apart from that more than one point of view must be reviewed by the medical superintendent, who is also tuberculosis officer for the area from which the majority of his cases come. From the standpoint of the district, isolation from the home, even to the end, may seem ideal ; but this ideal reckons without the human factor, as it affects not only the patient, but those who reside with the patient in the institution. From the standpoint of hospital management it is extremely undesirable that a pulmonary hospital should come to be regarded as a hospice for dying people. Such places are sufficiently depressing, alike for patients and staff, without carrying matters to extremes, and if isolation is not the only consideration—as, indeed, it is not—it is highly desirable that the depressing effects of dead and dying should be modified as far as possible. Otherwise one would experience difficulty, in the long run, in persuading people to leave their homes.

In Rufford, although many of the cases are undoubtedly severe, one likes to have a moderate proportion in a more hopeful state. The sight of improving cases is in itself a tonic to the rest, and lessens the irksome duties of nursing very considerably.

Modern methods of treatment undoubtedly contribute in some degree to this end. Many who would formerly have gone steadily downhill have received inestimable benefit from artificial pneumothorax treatment, and some have even progressed as far as cure. Seven cases were started on this line of treatment, and 104 refills were given in the course of the year. The treatment is carried out under X-ray control in order to determine the amount or efficiency of collapse and the need for renewal. Here the physician is his own radiographer as well as his own radiologist.

The total number of X-ray examinations was 353, in 175 of which skiagrams were taken. Amongst these one must record that 91 were of extern patients referred by their medical attendants, in 41 of which skiagrams were taken.

The number of sputum examinations was 242, of which 184 contained tubercle bacilli.

Lipiodol injections were employed for diagnostic purposes in a few cases.

The comfort and entertainment of patients received every attention as usual. The provision by the County Council of two spinal carriages was much appreciated, and enabled patients who are for the most part confined to bed and absolutely immobilized, to become further acquainted with the beauty of the hospital grounds—much to the relief of their monotony and the benefit of their condition.

A picnic during the summer months was thoroughly enjoyed by many, and at Christmas a party of children from Preston visited the hospital and enlivened sick persons by song and dance. Entertainment funds and donations—including an anonymous donation of two guineas—enabled the staff to purchase two additional loud speakers for wireless extension. The usual grants made through the kindness of the County Tuberculosis Committee, were devoted to replenishing and enlarging the stock of books in the library, and to obtaining various periodicals for use in the hospital. A consignment of books was received from the British Red Cross Society—not for the first time—and is hereby gratefully acknowledged. For the hire of pictures for use with the Kodascope, the Committee also made a substantial grant. The renewal of the annual grant for extra fare at Christmas on the part of the Committee was much appreciated.

Last year I referred to the charming surroundings of the hospital and the attention devoted to their maintenance by the Central Tuberculosis Officer. I need hardly say that much of the picturesqueness of the place is due to his unremitting care, and that this has been in no degree relaxed.

My task as medical superintendent has been much simplified by the loyalty and efficient assistance of Miss Moseley, the matron; to her, as well as to the nursing staff, I take this opportunity of expressing my obligation.

SUMMARY OF DISPENSARY WORK.

Number of tuberculous cases under supervision on 31st December, 1929
(Definitely tuberculous, 2030 ; doubtful, 11.) 2041

Examinations by Tuberculosis Officer at—	Examinations of *new persons* and *new contacts* for diagnosis.	Re-visits or re-attendances of "*old*" *cases* and "*old*" *contacts*.
Patients' homes	352	906
Seaforth Chief Dispensary	212	1109
St. Helens Branch Dispensary	131	614
Widnes Branch Dispensary	179	1237
*Wigan Branch Dispensary	239	1456
	761	4416

* New premises at 3, Mesnes Park Terrace, Wigan, were opened on 4th April, 1929.

Attendances of patients at dispensaries for artificial light treatment—		
St. Helens Dispensary	4124	5375
Wigan Dispensary	1251	
Care committee meetings attended by—		
(*a*) Tuberculosis officers		23
(*b*) Tuberculosis health visitors		52
Lectures or addresses given		2
Visits by tuberculosis officers to sanatoria, and pulmonary, special, and public assistance hospitals,		59
Special visits by tuberculosis officers (*i.e.*, interviews with medical officers of health, general hospital officials, &c.)		39
Visits by dispensary nurses to patients' homes—		
Routine visits	6468	7188
Actual nursing	179	
Application of surgical dressings	202	
Adjustment of splints and surgical appliances	339	
Patients' dispensary attendances for attention by nurses—		
Application of surgical dressings	432	515
Adjustment of splints and surgical appliances	83	
Sanitary defects reported to the local medical officers of health		84
Sanitary defects which after notification were remedied		57
Disinfections carried out by local sanitary authorities		415
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment		857

XV.—REPORT FOR FURNESS DISPENSARY SUB-AREA.

Area (estimated population, 38,657) embraces Dalton-in-Furness, Grange-over-Sands, Ulverston, and Ulverston Rural Districts.

Consultant Tuberculosis Officer ... Dr. E. H. Allon Pask.

(Dr. Pask is also medical superintendent of the High Carley and Oubas House Sanatoria).

Dr. Pask sends the following report :—

During 1929 the number of new cases notified, including 6 temporary residents, totalled 58, against 73 for the previous year. Seven cases were, with the consent of the medical attendants, cancelled as being non-tubercular.

The number of cases sent for an opinion by the medical men of the district continues to be considerable, but quite a large percentage are not definitely diagnosed as tuberculous; this, of course, is all to the good from several points of view, and especially emphasises the most cordial co-operation of the medical men in the district. Actually, 139 new cases presented themselves for examination ; 48 were definitely diagnosed as tuberculous on the first examination, 52 as non-tuberculous, and 39 as doubtful.

Quarterly visits were paid by me to the King Edward VII Hospital for Crippled Children, Sheffield, to confer with the medical superintendent, and to see the Lancashire County children undergoing treatment there.

Through the kindness of the Committee, I attended, during the autumn, a post-graduate course in X-ray work at the Brompton Hospital, London, which proved most helpful and instructive.

The number of cases assisted through the Care Fund during the year was 9, and the amount expended was £22 7s. 5d.

Artificial Light Treatment.

An artificial light centre was established at the Ulverston Dispensary on the 5th June, 1928.

The cases treated at the Ulverston Dispensary during the year have been chiefly those of tubercular glands of the neck, both with and without abscess formation and skin involvement. The best results have been obtained in those cases with skin involvement and abscess formation, as the time taken by the lesion to heal has been considerably shortened.

The most striking case treated was that of a girl, aged 18 years, suffering from a large sinus in the neck, which was discharging profusely. She looked ill and emaciated, and weighed only 6 st. 4 lbs. The skin, as a whole, was dry and unhealthy looking. After six months' light treatment she had gained 3 st. in weight, the sinus had completely healed, the skin had become supple and healthy, and her general appearance had improved almost beyond recognition.

The treatment has been largely carried out by two long-flame carbon arc lamps, using grade A (plain) carbons. In the latter part of the year grade C (metal impregnated) carbons were used in certain selected cases, and the length of exposures was increased up to the maximum of thirty minutes, with, I think, on the whole, beneficial results. With this type of carbon arc lamp one has to be extremely cautious and give the closest supervision, as in one or two cases too much erythema, with subsequent desquamation, was produced, and this should be avoided as far as possible.

In addition to the carbon arc lamps, we have a Kromayer lamp which is used for lupus cases. The number of such cases in this sub-area is exceedingly small, and it is difficult to generalise, although one case of lupus of the thigh has definitely improved during the treatment.

I have seen no definite ill effects as a result of the treatment. One woman patient discontinued treatment owing to the fact that after treatment she complained of attacks of palpitation.

One case of tubercle of the tongue was treated, but he was an exceedingly advanced case of pulmonary tuberculosis, and was too ill to make the journey for further treatment. He stated that during the time he had local treatment with the Kromayer lamp, the tongue condition was less painful.

No active cases of pulmonary tuberculosis were exposed to ultra-violet rays during the year.

The following Table 29 shows the results for patients treated at this centre during 1929 :—

Ulverston Centre.

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	3	1	—	—	—	1	1
Adenitis with abscess formation and skin involvement	10	4	—	—	—	—	6
Adenitis without softening	6	2	—	—	—	1	3
Bones, joints and spine	1	—	—	—	—	—	1
Pulmonary and non-pulmonary combined :—							
†T.B. plus and tongue	1	—	—	—	—	1	—
Total	21	7	—	—	—	3	11

* Includes: (1) any patient who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (*e.g.*, removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals

† Local treatment only for non-pulmonary condition.

Summary of Dispensary Work.

Number of tuberculous cases under supervision on 31st December, 1929 (Definitely tuberculous, 279 ; doubtful, 2.)	281

Examinations by Tuberculosis Officer at—	Examinations of *new persons* and *new contacts* for diagnosis.	Re-visits or re-attendances of " *old* " *cases* and " *old* " *contacts*.
Patients' homes	54	104
Ulverston Branch Dispensary	85	665

Attendances of patients at the Ulverston Dispensary for artificial light treatment		1289
Visits by tuberculosis officer to sanatoria and pulmonary, special, and public assistance hospitals		5
Special visits by tuberculosis officer (*i.e.*, interviews with medical officers of health, general hospital officials, etc.)		1
Visits by dispensary nurse to patients' homes—		
Routine visits	2197	2241
Actual nursing	28	
Application of surgical dressings	8	
Adjustment of splints and surgical appliances	8	
Sanitary defects reported to local medical officers of health		4
Sanitary defects which after notification were remedied		4
Disinfections carried out by local sanitary authorities		73
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment		101

XVI.—REPORT FOR FYLDE DISPENSARY SUB-AREA.

Area (estimated population, 61,934) embraces Fleetwood, Fylde Rural, Garstang Rural (part), Poulton, Kirkham, Preesall, and Thornton Districts.

Consultant Tuberculosis Officer ... ... Dr. G. Leggat.
(Dr. Leggat is also medical superintendent of the Elswick Sanatorium).

Dr. Leggat reports :—

I have found that the general work of the dispensary organisation has tended to increase. Full use has been made of the dispensary facilities by practitioners in the area, as is evidenced by the more frequent requests of doctors for cases to be seen, and the greater number of cases (about 90 per cent.) shown as being examined at the dispensary or at home prior to notification. Cases taken on the register, however, only represent a proportion of the cases actually seen, as consultations are numerous where the diagnosis of tubercle is not established.

During the year, 226 X-ray examinations of dispensary cases were made at the Elswick Sanatorium, and 182 examinations of sputum were carried out at the sanatorium laboratory, of which number 34 were found to be positive.

ARTIFICIAL LIGHT TREATMENT.

An artificial light centre was established in the Fylde Sub-Area at the Fleetwood Dispensary on the 25th June, 1928.

The light centre at Fleetwood has now been established for 18 months, so that I am in a more favourable position for forming an opinion as to the results. Speaking generally, they have been encouraging, especially in the virgin type of lupus and scrofulo-derma. Though in most other types the beneficial effects have not been as marked, yet almost all have shown gradual improvement under the treatment.

The number of cases treated increased, and necessitated having two full-day sessions per week instead of two half-days as at the commencement. This has necessarily reduced the usual routine visiting duties of the nurse.

As regards the types of cases treated at the light clinic, I have to report as follows :—

Lupus. The lupus vulgaris cases treated were all of long standing, most of them having had various treatments previously, and several bearing old X-ray scars. All except one have shown definite improvement, both to general exposure and local pressure with the Kromayer lamp, three cases being quiescent at the end of the year.

There were two cases of lupus erythematosus treated, and though in these the tubercular etiology is doubtful, both showed very definite improvement under treatment, and in one the disease had quite cleared up at the end of the year.

Adenitis with abscess formation. These, practically without exception, did well and showed ready response.

Adenitis without softening. I have found that this type does not show the same ready and immediate response, but after prolonged treatment there is usually improvement in the general condition. In cases where there are large masses of glands, softening and breaking down has been encouraged, and I think the use of the Kromayer lamp for local application stimulates the breaking down.

Bones and joints. There have been very few cases of this type attending the dispensary light centre during the year 1929, and the treatment was given more for general tonic effect. One might say that sinus cases in bones and joints (apart from those resulting from spines and hips) all improve with light.

Abdominal. Only one case attended, and did well.

Genito-urinary. One case treated did exceptionally well, the patient gained over a stone in weight, the urine became clear of albumen and negative for tubercle bacilli (previously positive), and all signs of bladder irritation disappeared.

From my 18 months' experience, I think the establishment of the light centre at Fleetwood has been worth the outlay, and certainly saves a great deal of the expense that would be incurred by sending patients away to various institutions for treatment. Light has proved a popular form of treatment among patients, and there has been little difficulty experienced in getting them to attend properly and regularly.

The following Table 30 shows the results for patients treated at this centre during 1929 :—

Fleetwood Centre.

Form of tuberculosis or part of body affected.	No. of cases treated during 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons. *	Still under treatment at end of 1929.
		Quiescent and apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofulo-derma) ...	11	4	1	—	1	—	5
Adenitis with abscess formation and skin involvement	17	8	2	—	—	1	6
Adenitis without softening	10	5	2	1	—	—	2
Bones, joints and spine	5	1	1	—	—	—	3
Abdomen	1	1	—	—	—	—	—
Other non-pulmonary conditions ...	2	—	—	—	—	—	2
Pulmonary tuberculosis :—							
Sputum positive	1	—	—	—	—	—	1
Bronchial glands	1	—	—	—	—	—	1
Pulmonary and non-pulmonary combined :—							
T.B. plus and bones	1	—	—	—	—	—	1
TOTAL	49	19	6	1	1	1	21

*Includes : (1) any patient who did not receive two month's treatment ; (2) patients ceasing light treatment prematurely (*e.g.*, removals, unwilling or unable to continue) ; and (3) patients transferred to sanatoria or hospitals.

SUMMARY OF DISPENSARY WORK.

Number of tuberculous cases under supervision on 31st December, 1929 (Definitely tuberculous, 397 ; doubtful, 1.) 398

Examinations by Tuberculosis Officer at—	Examinations of *new persons* and *new contacts* for diagnosis.	Re-visits or re-attendances of " *old* " *cases* and " *old* " contacts.
Patients' homes	54	167
Fleetwood Branch Dispensary	131	657

Attendances of patients at the Fleetwood Dispensary for artificial light treatment 2575

Visits by tuberculosis officer to sanatoria and pulmonary, special, and public assistance hospitals,		8
Special visits by tuberculosis officer (*i.e.*, interviews with medical officers of health, general hospital officials, etc.)		2
Visits by dispensary nurse to patients' homes—		
Routine visits	2146	2203
Actual nursing	11	
Application of surgical dressings	26	
Adjustment of splints and surgical appliances	20	
Patients' dispensary attendances for attention by nurse—		
Application of surgical dressings	8	9
Adjustment of splints and surgical applicances	1	
Sanitary defects reported to local medical officers of health		12
Sanitary defects which after notification were remedied		7
Disinfections carried out by local sanitary authorities		69
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment		135

XVII.—CARE WORK.

The County care scheme was fully reviewed in the report for 1928, and as there has not been any further development, it is not proposed to recapitulate.

TABLE 31.—*Work done by Voluntary Care Committees.*

Name of Committee.	Estimated Population Served 1929.	Number of Individual Patients Assisted during 1929.	Expenditure during 1929. £ s. d.
Ashton-under-Lyne and District... ...	69,533	54	330 7 11
Bacup and Rawtenstall	49,310	15	16 13 11
Chorley and District	74,134	36	253 0 7
Earlestown, Newton and District ...	22,373	27	49 13 8
Eccles Guild of Help	45,040	5	6 2 4
Egerton, Eagley and District	5,759	2	8 2 1
Farnworth and District	70,387	38	118 5 4
Golborne	7,444	14	56 17 1
Horwich	16,540	28	217 18 3
Huyton-with-Roby District	5,174	1	2 4 9
Lancaster and District	83,032	14	63 16 8
Leigh and District...	90,164	69	154 6 0
Prescot and District	21,177	16	112 14 2
Prestwich	21,590	4	21 2 11
*Radcliffe, Whitefield and District Relief Fund	36,276	19	177 5 0
Stretford Guild of Help	52,240	18	72 6 7
Westhoughton	17,290	18	63 13 3
Widnes	40,890	23	40 4 7
Wigan County District	116,642	74	98 7 3
TOTAL	844,995	475	1,863 2 4

* Relates to year ended 31st March, 1930.

The County Council has continued to make a grant of 33⅓ per cent. of the committees' expenditure on actual assistance to patients.

The voluntary care committees only cover a little less than half the County, and there is left a balance of nearly 1,000,000 persons to be dealt with by other means, pending the formation of new voluntary committees. In the areas without care committees the County Council have charged the tuberculosis dispensary staff with the duty of carrying out the relief work. During 1929, assistance in kind was afforded through the dispensary staff to 180 individual patients, the amount expended being £621 16s. 8d.

With the transfer of the Poor Law functions to the County Council, arrangements have been made to continue co-operation with the Public Assistance Committee and their Guardians Committees so as to prevent overlapping in rendering assistance in necessitous or destitute cases.

XVIII.—COUNTY SANATORIA AND HOSPITALS.

(1) High Carley Sanatorium, near Ulverston.

Medical Superintendent ... ... Dr. E. H. Allon Pask.

(Dr. Pask is also visiting medical superintendent of Oubas House Children's Sanatorium, Ulverston, and consultant tuberculosis officer for the Furness Dispensary Sub-Area—*i.e.*, the area around the sanatorium—containing a population of 38,657).

Assistant Medical Superintendent ... Dr. J. L. Armour.

Matron: Miss E. Woosey.

(The matron is also responsible for the Oubas House Children's Sanatorium, Ulverston).

High Carley Sanatorium is situated about three miles west of Ulverston, to the south of the main road to Barrow-in-Furness. The buildings stand in about 23 acres of ground, and accommodation at the end of the year was provided for 112 patients (62 males and 50 females).

The medical superintendent and the assistant are accommodated on the estate; and seven houses are provided in the vicinity of the sanatorium for the male employees.

Electricity was in 1929 obtained from the public supply in replacement of the sanatorium plant.

The agreement between the County Council and the Barrow-in-Furness Corporation for the reservation at High Carley of a number of beds, not exceeding 16, for Borough patients, was discontinued on the 31st December, 1929, and now all the patients are from the County area.

During the year 179 County patients received some form of dental treatment from the visiting dental surgeon (Mr. A. Miller).

Dr. Pask reports as follows on matters relating to the treatment of the patients and the administration of the sanatorium:—

The treatment at High Carley has proceeded on similar lines to those employed in previous years. Pulmonary tuberculosis is a general infection with local manifestations in the lungs, and sanatorium treatment *per se* consists chiefly in combating the general infection by building up what is called, for want of a better term, the resistance of the individual. This is attained by fresh air, nourishing food, graduated work and exercise, and general hygienic surroundings. The local lung condition is a more difficult matter to deal with, and the main essential in the treatment is rest of the affected part. This is attained to a certain degree by systematic rest, but unfortunately the rest given to the lungs is only relative, as individuals must breathe in order to live. Rest time carefully supervised is a most valuable part of sanatorium treatment, as when patients are perfectly quiet in a recumbent position, respiration is slow and shallow ; thus, the movements of the chest, and consequently the diseased areas in the lungs, are less than when the patients are walking about. In the majority of cases these measures are sufficient to bring about an improvement in the condition. It becomes necessary, however, in cases in which improvement does not take place, to consider other measures, and the most important of these is an attempt to deal with the local condition in the lung by means of artificial pneumothorax, which gives rest to the affected side. A special report on artificial pneumothorax treatment at High Carley will be found on page 26.

Sanocrysin has been given a trial, and the results of the treatment are given in the chapter commencing on page 4.

As regards occupational therapy, I am coming to the conclusion that this requires the most careful supervision. On looking back after a lengthy experience, it is a question whether, in some cases, it did not do more harm than good, for at one time it was general to lay stress on this form of treatment, and patients with extensive trouble were set tasks which they were physically incapable of doing. The most important factor is to set individuals tasks in which they take an interest, and which they are capable of doing without undue fatigue. The various forms of occupation which are undertaken were fully dealt with in my report for 1925. The poultry farm, managed by the women patients, continues to more than pay its way, and a profit of £23 was made during the year. The boot repairing department carried out 114 repairs.

Artificial sunlight is a form of treatment which might be usefully employed in carefully selected cases in conjunction with sanatorium treatment and under strict supervision. This form of treatment has been employed with marked success in non-pulmonary cases, and there does not seem to be any valid objection to its being used for pulmonary cases, especially at a sanatorium where its effects can be closely watched. It has been urged that it is apt to produce hæmoptysis ; hæmoptysis occurs during sanatorium treatment, but no one blames sanatorium treatment for this. An artificial light plant would form a useful adjunct to the treatment at High Carley.

Below are given the numbers of X-ray photographs and screen examinations during the year, together with those for 1928 :—

	Sanatorium Cases.		Dispensary Area Cases.	
	Skiagrams.	Screen Examinations.	Skiagrams.	Screen Examinations.
1929	302	369	213	148
1928	194	176	180	145

From these figures it will be seen that the work in the X-ray department has increased enormously. No chest examination is complete without a skiagram and screening, and it is now part of the routine of every case, like the examination of sputum. X-ray examination is not infallible, but it cannot be neglected. It is being used increasingly here at intervals to note the progress made, and is invariably used at short intervals in cases which are having special treatment, *e.g.*, Sanocrysin, artificial pneumothorax, and oleothorax. A new metalix tube, to replace the old gas tube, was installed during the year, consequent on the substitution of the main electric supply from Barrow for our local generating plant.

Patients admitted to the institution during the year with positive sputum totalled 137, and of these 39 were discharged with negative or absent sputum. The bacillary loss worked out at 28·46 per cent. as compared with 18·69 per cent. for the previous year, and 18·07 per cent. for the five years 1924–28. I think this better result is explained by the fact that patients stay in the sanatorium for a longer period than formerly—5·4 months against 3·3 eight years ago. This index of the result of treatment is a very useful one, and gives an indication of the loss of infectivity, which is an important point, although there are fallacies in laying too much stress on it.

Sputum examinations during the year numbered 1,431—844 being found positive and 587 negative.

Particulars were recorded of the weight of patients who were discharged after completing two or more months' treatment, and the figures are as follow :—

142 males—average gain in weight, 9·77 lbs.
65 females—average gain in weight, 10·76 lbs.

A Cine-Kodak apparatus was bought towards the end of the year at a cost of £55 17s. 5d., the money being provided through the generosity of numerous friends of the sanatorium and by a grant from the County Tuberculosis Committee to whom our best thanks are due. Weekly shows are given to the patients and staff, and are much appreciated. In addition, recreation is provided for the patients in the form of billiards, whist drives, card games, etc. ; numerous concert parties have also generously given their services during the winter months. In the summer time bowls and croquet are allowed for those patients who are physically fit. The wireless set, which has been in use now for six years, still functions satisfactorily, and loud speakers are installed in various parts of the sanatorium.

There is a well-stocked library of 1,350 volumes provided for the patients and staff which is kept up-to-date by annual renewals provided by a grant from the Committee. In addition, there is a reference library containing books of a semi-technical character, which is also available for patients in other County sanatoria and pulmonary hospitals on application being made to the medical superintendent. Loans of books to the patients and staff during the year were 6,619.

As in previous years, lectures were given to the probationers in nursing, elementary anatomy, and physiology; Nurses Steel and Butterfield, who had completed two years' service, were successful in obtaining certificates for passing the examination in these subjects.

In November, a well-attended meeting of the North Lancashire and South Westmorland British Medical Association was held at the sanatorium. I read a paper on " Some points in the diagnosis of pulmonary tuberculosis," and an interesting discussion followed. The members afterwards made a tour of the institution, a demonstration of artificial pneumothorax being given, and cases shown who were receiving Sanocrysin treatment.

The following Table 32 shows the condition of patients discharged during the year 1929 :—

Classification on admission to the Sanatorium.	Condition at time of discharge.	Duration of Residential Treatment in the Sanatorium.				Total.	
		Under 3 months.	3—6 months.	6—12 months.	More than 12 months.	No.	%
T.B. Minus.	Quiescent	17	10	6	2	35	58·3
	Improved	7	9	3	—	19	31·7
	No material improvement ...	3	1	—	—	4	6·7
	Died in Sanatorium	2	—	—	—	2	3·3
T.B. Plus 1.	Quiescent	1	1	2	—	4	11·4
	Improved	9	4	7	—	20	57·1
	No material improvement ...	2	4	2	1	9	25·7
	Died in Sanatorium	2	—	—	—	2	5·7
T.B. Plus 2.	Quiescent	4	2	4	1	11	11·3
	Improved	30	17	11	7	65	67·0
	No material improvement ...	8	4	5	1	18	18·5
	Died in Sanatorium	2	—	1	—	3	3·1
T.B. Plus 3.	Quiescent	—	—	1	—	1	7·1
	Improved	6	—	1	—	7	50·0
	No material improvement ...	1	2	—	—	3	21·4
	Died in Sanatorium	3	—	—	—	3	21·4
		Under 1 week.	1—2 weeks.	2—4 weeks.	More than 4 weeks.		
Observation for purpose of diagnosis.	Tuberculous (pulmonary) ...	—	1	—	6	7	36·8
	Non-tuberculous	—	—	3	9	12	63·1
	Doubtful	—	—	—	—	—	—
					Total ...	225	

(2) OUBAS HOUSE CHILDREN'S SANATORIUM, ULVERSTON.

The medical superintendent, assistant medical superintendent, and matron of the High Carley Sanatorium, are also responsible for the work at Oubas House. The sister-in-charge is Miss D. Pope, and the certificated school teacher is Miss A. Gibson.

The house, now the property of the County Council, stands in its own grounds (about one acre in extent), and accommodates 21 girls. A portion of an army hut has been adapted for use as a classroom. Educational instruction is given to the children in conformity with the requirements of the Board of Education.

Dr. Pask reports as follows :—

During the year 23 children were admitted to the sanatorium and 24 discharged. Included in the discharges were 8 cases sent for observation in regard to diagnosis, 4 of which were diagnosed as definite cases of pulmonary tuberculosis and 4 found to be non-tuberculous. The condition on discharge of the 20 tuberculous patients was : quiescent, 12 ; improved, 4 ; stationary, 3 ; worse, 1.

Ninety-nine specimens of sputum were examined, of which 20 were positive and 79 negative.

In May one case of scarlet fever occurred ; after treatment in the fever hospital the girl was re-admitted to the sanatorium in July.

Treatment by natural sunlight has been carried out whenever possible, and I am convinced that in cases of pulmonary tuberculosis it is a most useful adjunct to sanatorium treatment. I have not seen any ill effects from this treatment. A careful selection of cases is made, and a definite graduated increase of dosage is employed. If treatment is carried out on these lines no ill effect will follow. Sunlight should be made use of in a similar manner to drug treatment. Drugs given in excess of the therapeutic dose will do harm, and so will sunlight ; that is why it is so important that the dosage should be carefully graduated and controlled.

Early in 1929 research was undertaken with irradiated milk (*i.e.*, exposed to ultra-violet rays), and a report of the experimental work will be found on page 18.

Much useful work is done during school hours, apart from the regular school routine, such as rug making, raffia work, cane work, and gardening. Household duties are also taught, such as dusting, the laying of tables for meals, boot cleaning, etc.

Whenever possible school work is done on the lawn in front of the school room, and often picnic teas are arranged. Twice during the year the children were taken for outings ; once to Bardsea, and once to Lakeside, Windermere. These treats are greatly appreciated, and are talked about for months afterwards.

A Ministry of Health inquiry was held in Ulverston on the 18th September, 1929, in regard to a proposal of the District Council to purchase land adjoining the sanatorium for use as a refuse tip. Protest was made by the Lancashire County Council on account of the proximity to the sanatorium, and as a result the scheme was abandoned.

An inspection of the sanatorium was made by Dr. Muriel Bywater, on the 10th September, 1929, on behalf of the Board of Education; satisfaction was expressed with the arrangements made for the treatment and education of the children.

Mr. E. G. Woolgar, a member of the County Tuberculosis Committee, has visited the sanatorium and school every quarter, in succession to the late Mr. Dilworth.

(3) Elswick Sanatorium, near Kirkham.

Medical Superintendent ... ... Dr. George Leggat.

(Dr. Leggat is also consultant tuberculosis officer for the Fylde Dispensary Sub-Area—*i.e.*, the area around the sanatorium—containing a population of 61,934).

Matron: Miss I. G. Barclay.

This sanatorium is situated on the east side of Elswick village, and is about six miles from Kirkham station. The buildings and about 11 acres of land belong to the Fylde, Preston, and Garstang Joint Smallpox Hospital Board, and are held on lease by the County Council until 1955. The Council are under an obligation to vacate the premises in case of a severe epidemic of smallpox, The accommodation provided is: Pulmonary cases, 16 males and 25 females; non-pulmonary cases, 12 males and 12 females; total 65. An X-ray apparatus is provided in a separate building erected in 1925.

During the year 57 County patients received some form of dental treatment from the visiting dental surgeon (Mr. J. J. Ward).

Dr. Leggat reports as follows on matters relating to the treatment of patients and the administration of the sanatorium :—

The work at the sanatorium has been carried out on similar lines to previous years, whilst every endeavour has been made to undertake specialised forms of treatment.

It is now fully realised that in all forms of acute tuberculosis, rest is an essential factor in the treatment, with, as far as possible, fixation of the affected part. In non-pulmonary cases the latter is easily attained, either by various forms of splints or by plaster. In pulmonary cases, however, apart from artificial pneumothorax, there is difficulty in applying adequate fixation for keeping the lungs and body satisfactorily at rest. We are fortunate at Elswick in having the two types of tuberculosis to treat, and on the non-pulmonary side it has been noticed (more particularly in spinal cases where there are no complications) that in spite of the prolonged fixation in bed, the general condition of the patient shows decided improvement, with visible increase in weight. In view of this, it was thought it might be worth experimenting on similar lines with acute pulmonary cases, *i.e.*, to fix them in spinal jackets so that absolute rest could be assured. In ordinary sanatorium routine treatment absolute rest in bed may be prescribed for a patient, but it is difficult to ensure that this rest is being properly carried out, as without some mechanical means it is not easy for a patient to keep himself absolutely at rest. By applying a jacket and fixing the patient down in bed, this rest, so essential, can be definitely assured. Accordingly, this line of treatment has been more or less generally adopted at Elswick for the past 18 months, with very encouraging results. For the purpose, the ordinary spinal jacket, as used in the treatment of spinal caries, has been adapted. It has been noticed that after the jacket has been applied the chest respirations tend to diminish, and the breathing to become abdominal. Any new form of treatment undertaken in a sanatorium generally becomes popular, so that one has to view with scepticism any beneficial effects ascribed to the treatment by the patients themselves. At the same time, most of the patients so treated at Elswick have remarked on the improvement in their general well-being, the diminution of cough, and the apparent support given to the chest, especially on coughing. To sum up, the principles of this form of treatment are the same as apply in spinal cases, with certain modifications to the jacket, *viz.*, the webbing straps are made to go right round the chest, and extra ones are applied in the axillary and apical regions, the tension on these straps being gradually increased to the limit that each individual can stand. The patients' backs, in regard to being kept clean, etc., are treated as in spinal cases. Though this form of treatment for pulmonary patients has meant an increase of work for the nursing staff, it has not been found necessary to engage extra staff. Much of the success of treatment by splints, whether in pulmonary or non-pulmonary cases, depends on the care and attention given by the nurses, particularly in seeing that the splints are properly applied and adjusted.

It is well known that the end result of a tuberculous lesion, whether pulmonary or non-pulmonary, is very often calcification. Realising this, various authorities have tried the effect on tuberculosis of calcium medication. Like others, we have never found at Elswick any definite effect on pulmonary cases from the administration of calcium, either orally or by injection, in its most absorbable form as one of the colloidal preparations. Several cases in the past have been treated at Elswick, but X-ray control has never revealed any increase of signs of calcification in the lungs, nor did it appear to have any direct bearing on the progress of the disease. We know that coal dust can reach the lungs by inspiration, and produce anthrocosis ; similarly, particles of silica can produce silicosis. From these facts one would naturally come to the conclusion that calcium could reach the lungs by a similar route. I communicated my views in the matter to Messrs. Parke, Davis & Co., Ltd., London, and they kindly supplied me with two calcium salts—calcium carbonate and calcium stearate (the two least absorbable of the calcium salts)—in a very fine amorphous powder, and experiments are now being conducted with these by direct inhalation, to see whether any beneficial effect can be produced. According to published statistics, pure calcium workers have a low incidence of tubercle and respiratory diseases generally.

Artificial pneumothorax has been tried during the year in selected cases. As with most other medical workers, however, it has been found that this very important adjunct of treatment is limited. The ideal uni-lateral case, provided there is no definite destruction of lung and the patient can afford the time, will usually get better without pneumothorax ; so that most cases to be done are of the bi-lateral type, being those with destruction of the lung and cavitation asking for a collapse, or those that are not doing well with ordinary treatment.

As regards the non-pulmonary section, treatment has been maintained on the usual lines, *i.e.*, increasing the general resistance of the patient with fresh air and good wholesome food, and adopting conservative measures for local conditions so as to prevent deformity, and where deformity is already established to correct it. Operation is avoided if possible, though in certain cases minor operations become necessary for the aspiration of abscesses, removal of sequestræ, and opening up of pus when pocketing. On the several occasions when major operations have been deemed advisable, they have been very ably carried out by Mr. W. McKerrow, F.R.C.S., of Preston. The non-pulmonary wards at Elswick are only of improvised type, but a great deal of excellent work on modern lines has been accomplished in the making of plaster casts and celluloid splints ; in fact, the majority of splints used have been made in our plaster-room and workshop. The only appliances that have had to be purchased from an outside source have been the spinal frames and leather supports, due to the fact that we have not an expert instrument maker on the premises. As regards special treatment carried out on the non-pulmonary side, light has been the most important—both natural and artificial sunlight being used. The institutional light equipment consists of three mercury vapour lamps. The Jesionek lamp for local treatment has proved of great value, more particularly for sinuses. Cases of sinuses of the superficial joints undoubtedly do well, both with local and general treatment, but the results with the deeper sinus cases are disappointing, though even with these there are occasional ones that succeed.

The following Table 33 gives the condition of patients discharged during 1929 :—

Classification on admission to the Sanatorium.	Condition at time of discharge.	Duration of Residential Treatment in the Sanatorium.				Total.	
		Under 3 months.	3—6 months.	6—12 months.	More than 12 months.	No.	%
	(*a*) Pulmonary.						
T.B. Minus.	Quiescent	6	3	7	3	19	61·3
	Improved	4	1	—	—	5	16·1
	No material improvement ...	3	1	1	—	5	16·1
	Died in Sanatorium	2	—	—	—	2	6·4
T.B. Plus 1.	Quiescent	—	2	2	3	7	63·6
	Improved	—	2	—	1	3	27·3
	No material improvement ...	—	—	1	—	1	9·1
	Died in Sanatorium	—	—	—	—	—	—
T.B. Plus 2.	Quiescent	—	1	1	4	6	24·0
	Improved	3	5	2	4	14	56·0
	No material improvement ...	3	—	—	1	4	16·0
	Died in Sanatorium	—	—	1	—	1	4·0
T.B. Plus 3.	Quiescent	—	—	—	—	—	—
	Improved	—	—	—	1	1	100
	No material improvement ...	—	—	—	—	—	—
	Died in Sanatorium	—	—	—	—	—	—
	(*b*) Non-Pulmonary						
Bones and Joints	Quiescent	1	1	1	4	7	63·6
	Improved	1	—	2	—	3	27·3
	No material improvement ...	—	—	1	—	1	9·1
	Died in Sanatorium	—	—	—	—	—	—
Abdominal	Quiescent	1	1	—	1	3	75·0
	Improved	1	—	—	—	1	25·0
	No material improvement ...	—	—	—	—	—	—
	Died in Sanatorium	—	—	—	—	—	—
Peripheral Glands and Other Organs	Quiescent	—	1	2	—	3	100
	Improved	—	—	—	—	—	—
	No material improvement ...	—	—	—	—	—	—
	Died in Sanatorium	—	—	—	—	—	—
	(*c*) Observation Cases	Under 1 week.	1—2 weeks.	2—4 weeks.	More than 4 weeks.		
Observation for purpose of diagnosis.	Tuberculous (non-pulmonary) ...	—	—	—	1	1	100
	Non-tuberculous	—	—	—	—	—	—
	Doubtful	—	—	—	—	—	—
					Total ..	87	

The number of skiagrams made of sanatorium cases was 236, and in the institution laboratory 252 examinations of sputum were carried out, of which 116 were positive for tubercle bacilli.

As regards forms of recreation and entertainment for the patients, I have to mention that we are now in the fortunate position of being able to purchase a Kodascope, the sum of £40 6s. 0d. having been collected through the generous response of friends in the neighbourhood, and the sum of £25 having been kindly granted by the County Tuberculosis Committee. The showing of cinematograph films will, I am sure, give great pleasure to the patients and staff, especially during the winter months.

A new form of occupation has been commenced, *viz.*, leathercraft ; already some very beautiful bags, book-covers, purses, etc., have been made by the female patients. So far the demand for the articles has been greater than the supply.

The workshop continues to furnish an excellent form of occupational therapy for the male patients, and some most useful work has been turned out under the supervision of a patient who is a carpenter and handyman. A large variety of furniture and fittings has been made, as well as a new pig-sty, and all small general repairs and woodwork done on the premises. We have at present under construction a double wooden hut, to give both sitting-room and sleeping accommodation for one of the nursing staff, and also a store-room for apples.

Attention to patients' teeth is a most important item, as unfortunately in Lancashire the majority of patients admitted to institutions come in with carious teeth, and it is impossible to hope for the best results under treatment when the teeth are a source of septic infection. The visiting dentist—Mr. J. J. Ward, of Preston—sees all new cases on admission, and cleans up the mouths. I should like to pay tribute to the most excellent manner in which he has carried out his duties.

No new extension to the garden has been made this year, as we are at our limit in this direction. The gardens are well kept, and visitors to the institution are always struck by their beauty. The lay-out of the grounds has been effected with a view to making the surroundings pleasant for patients and staff. When one looks back to 1914 and recalls the desolate waste that then obtained, it is surprising what has been accomplished. The greatest part of this work has been carried out under the instructions and supervision of the Central Tuberculosis Officer, and to his untiring efforts to keep everything up to standard is due to the credit for the garden having reached its present state of perfection.

The keeping of poultry has been a source of instructive occupation to a number of the patients, and, under the direction of one of the male staff, has shown a handsome turnover to the institution. During 1929 the number of eggs passed into the house was 22,086, which, based on the local wholesale market price, showed a profit for the year of £55 16s. 2d., and after deducting £29 18s. 2d., representing 20 per cent. depreciation on the poultry equipment, left a balance of £25 18s. 0d.

(4) CHADDERTON PULMONARY HOSPITAL, NEAR OLDHAM.

Visiting Medical Superintendent ... ... Dr. JAMES WOOD.

(Dr. Wood is also medical officer to the Chadderton, Royton, and Crompton Joint Hospital Board, and the medical officer of health of the Urban District of Chadderton).

Matron: Miss E. SIMMONS.

An agreement was made on the 1st October, 1919, with the Chadderton, Royton, and Crompton Joint Hospital Board for the use of the buildings at Racefield, erected as a smallpox hospital, for the treatment of patients suffering from pulmonary tuberculosis. Accommodation is provided for 45 female patients. The County Council are under an obligation to vacate the premises in case of an epidemic of smallpox.

Dr. Wood reports as follows :—

During the year 102 patients were admitted. Of this number, 13 were under 16 years of age, and 22 were between 16 and 20 years. One case was admitted for observation. Sixty-one patients were discharged (including six who were transferred to sanatoria or other hospitals), and thirty-seven died.

Treatment has been carried out on similar lines to previous years, and although most of the cases are advanced ones, the improvement in some has been marked. No special forms of treatment have been used during the year.

During the year 166 specimens of sputum were examined, of which 82 were positive and 84 negative.

On the whole the patients have been happy and have appreciated what has been done for them by the nursing staff.

A weekly service is held for the patients, for which there is a rota of clergymen from the surrounding districts.

We have to thank friends from Royton, St. Matthew's Church, Healds Green, the Salvation Army, Girl Guides, etc., for the various entertainments which they have given at the hospital.

Christmas was again a happy time, the whist drives and the concert given by the patients and staff being much appreciated.

Good use has been made of the books in the patients' and the staff libraries.

(5) HEATH CHARNOCK PULMONARY HOSPITAL, NEAR CHORLEY.

Visiting Medical Superintendent ... ... Dr. J. W. RIGBY.

(Dr. Rigby is also medical officer to the Chorley Joint Hospital Board).

Matron: Miss H. SINCLAIR.

By agreement with the Chorley Joint Hospital Board, the County Council erected, equipped, and furnished two pavilions, containing 16 and 14 beds respectively, together with a dining-hall and some staff accommodation. The Joint Board are responsible for the administration of the hospital, the County Council paying to them the cost of maintenance.

Dr. Rigby has kindly furnished the following report :—

The conduct of the hospital has been carried on as in previous years, and no radical change in routine has been found to be necessary. As we receive mostly bad cases, our first consideration and aim is to make them comfortable, and in this way supply what aid is possible towards their recovery. This requires individual treatment for the bad bed cases with respect to food and nursing.

We have been pleased to receive several patients for observation and diagnosis, and also some in whom the disease was not far advanced. These, however, do not make a prolonged stay, for if they are likely to improve we feel it our duty to transfer them to a place where facilities for more active treatment are available.

Difficulty is experienced with the type of case who would benefit from some occupation to fill in part of his time. He has generally been to many sanatoria previously, and it is difficult in a place where some are able to work and others not, to induce him to do a little voluntary work in the garden or with the poultry.

We also get another type of patient—one who has been the round of the sanatoria and whose home conditions are not suitable for domiciliary treatment. He makes a prolonged stay at a place like

Heath Charnock, because of the consideration shown to his likes, and because he dislikes being transferred to a hospital where he has been previously. This lengthy stay is not always an aid in the smooth conduct of the institution. In spite of these small worries, we try to carry on the work for which the hospital was built—to protect others from the spread of infection by keeping the patient until other suitable accommodation can be found for him, and by teaching him how to deal with his sputum ; also to protect himself from unnecessary risks of deterioration by allowing him to undertake only the amount of work suitable for his individual case.

The men's cubicles have been fitted with ear-phones from the wireless set, as these are preferred to the loud-speaker. The patients in the women's cubicles at present have a loud-speaker, but a system of ear-phones is to be installed.

We endeavour to do everything that will ease the patients, both mentally and physically, in their prolonged illness.

(6) Wrightington Hospital, Parbold.

The County Council, in November, 1921, purchased Wrightington Hall, outbuildings and estate of 159 acres, with a view to utilising it eventually for the provision of accommodation for children and adults.

The Hall is situated close to the high road between Standish and Parbold, about six miles north-west of Wigan, and stands at an altitude of 300 feet above sea level.

Plans were prepared in 1921 for the adaptation of the buildings, but under instructions from the Ministry of Health no work was commenced, and the scheme remained in abeyance until early in 1926, when the County Council approved generally of proposals to adapt the Hall and erect buildings to accommodate 226 patients—80 beds for adults and 146 for children. Plans have been approved by the County Council and the Ministry of Health, and a Government grant of £180 per bed has been promised towards the capital expenditure, which is estimated to be £129,520. A tender for the work has been accepted, and building commenced on the 13th August, 1929.

(7) Peel Hall Pulmonary Hospital (Dispensary Area No. 4).

(8) Rufford Pulmonary Hospital (Dispensary Area No. 5).

(9) Withnell Pulmonary Hospital (Dispensary Area No. 2).

It has already been explained in the chapter on the dispensary organisation (pages 57 to 59), that the Administrative County, containing a population of 1,811,700, is divided into five large dispensary areas, with an average population of 350,000, each area being in the charge of a consultant tuberculosis officer who has two assistant tuberculosis officers and other staff. The aim of the County Council has been to provide in each area a pulmonary hospital containing about 50 beds for the diagnosis of observation cases and the treatment of intermediate and advanced cases of pulmonary tuberculosis near their homes, the consultant tuberculosis officer of the particular dispensary area acting as the visiting medical superintendent. In addition to the five large areas there are two dispensary sub-areas—Furness and Fylde—in the charge respectively of the medical superintendent of the High Carley Sanatorium and the Elswick Sanatorium. Thus, the dispensary side of the work is not divorced from the institutional side.

The report for each of the above-named hospitals is contained in the report of the consultant tuberculosis officer for the area, *viz.*, for Peel Hall in Dispensary Area No. 4, page 86 ; for Rufford in Dispensary Area No. 5, page 94 ; for Withnell in Dispensary Area No. 2, page 76.

XIX.—DENTAL TREATMENT.

Patients eligible for dental treatment are those who, in the opinion of the medical superintendent or tuberculosis officer, are unable to derive full benefit from their treatment for tuberculosis owing to defective teeth. Patients already covered by dental schemes of other bodies, *e.g.*, school children and tuberculous pensioners, are excluded from benefit. For insured persons who are tuberculous many approved societies make a contribution towards the cost of dental attention required.

The following statement shows the dental work carried out during 1929, under the scheme approved by the County Council :—

Table 34.

	At County Council Sanatoria.		At other Sanatoria and Hospitals.	At Patients' Homes.	Total.
	High Carley	Elswick			
Number of individual patients who received dental attention (any form)	179	57	82	23	341
New dentures provided—					
(*a*) Complete sets	22	6	26	10	64
(*b*) Partial sets	18	7	12	10	47
Repairs to dentures	14	1	12	3	30
No. of extractions	269	154	423	301	1,147
No. of fillings	44	2	7	1	54
No. of scalings and cleanings ...	2,639	139	5	2	2,785
No. of other operations	301	64	—	2	367

The dental scheme, considering the benefit derived by the patients, has proved economical, and is fully justified.

XX.—THE TREATMENT OF PULMONARY TUBERCULOSIS.

Institutional Treatment.

In previous reports the immediate results of the treatment of patients suffering from pulmonary tuberculosis were given separately for those patients who went to a sanatorium and for those who went to a pulmonary hospital. The sanatorium used to take almost exclusively early and intermediate cases likely to improve, and the pulmonary hospital a majority of advanced cases for whom there was little hope of cure. During the past few years, however, the provision of additional accommodation in pulmonary hospitals, the installation of X-ray plants and the application of special treatment (*e.g.*, artificial pneumothorax and Sanocrysin) have made a sharp division between the type of patient sent to sanatoria and to pulmonary hospitals untenable, particularly for the intermediate stage case which may be sent to one or the other according to the state of the waiting list. A further important point is that it is not advisable, for obvious reasons, to take in pulmonary hospitals more than one-third acute cases.

The following Table 35 summarises the *immediate* results of treatment of patients discharged in 1929 from sanatoria and pulmonary hospitals :—

Classification on admission to the Institution.	Condition at time of discharge.	Duration of Residential Treatment in the Institution.												Total Patients discharged.	
		Under 3 months.			3—6 months.			6—12 months			More than 12 months.				
		M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	No.	%
T.B. Minus.	Quiescent	15	15	2	8	23	8	6	9	13	4	1	8	112	38·3
	Improved	18	12	5	17	19	3	16	5	8	4	8	2	117	40·1
	No material improvement	13	14	3	5	—	1	1	1	1	1	1	2	43	14·7
	Died in institution. ...	9	7	1	2	—	—	—	—	—	—	1	—	20	6·8
T.B. Plus 1 (Early)	Quiescent	2	—	—	3	6	—	4	5	—	—	4	—	24	23·5
	Improved	13	—	—	8	5	—	6	8	—	3	2	1	46	45·1
	No material improvement	6	1	—	3	2	1	4	3	1	1	1	—	23	22·5
	Died in institution. ...	2	3	1	1	1	—	—	—	—	—	1	—	9	8·8
T.B. Plus 2 (Intermediate)	Quiescent	7	1	—	5	7	—	8	5	—	—	6	—	39	6·1
	Improved	67	17	—	82	48	—	36	36	2	23	25	—	336	52·9
	No material improvement	31	27	—	19	20	—	16	16	—	7	4	—	140	22·0
	Died in institution. ...	38	16	1	14	17	—	17	8	—	6	3	—	120	18·9
T.B. Plus 3 (Advanced)	Quiescent	1	1	—	1	—	—	—	2	—	—	—	—	5	2·8
	Improved	8	4	—	9	6	—	11	8	—	2	4	—	52	28·9
	No material improvement	23	7	—	5	7	—	8	2	—	4	4	—	60	33·3
	Died in institution. ...	32	12	—	6	2	—	4	1	—	3	3	—	63	35·0
	Total	285	137	13	188	163	13	137	109	25	58	68	13	1209	—
		Under 1 week.			1—2 weeks.			2—4 weeks.			More than 4 weeks				
Observation for purpose of diagnosis.	Tuberculous	1	—	—	1	1	1	2	—	—	6	5	2	19	35·8
	Non-tuberculous	—	—	—	2	—	—	4	2	—	11	8	7	34	64·1
	Doubtful	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Grand Total 1,262

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*Classification in accordance with Memorandum 37/T of the Ministry of Health.

The table illustrates that the best results are achieved when institutional treatment is given before the sputum becomes positive—the more advanced the disease the less satisfactory progressively are the results. This only goes to prove what has been said so often, that the earlier treatment for pulmonary tuberculosis is commenced the better the chances of recovery.

Referring to the pulmonary hospitals, they are also used for patients sent for the purpose of isolation, for observation in regard to diagnosis, and particularly for education in general methods of hygiene which, when the patients return home, can be applied much more effectively after a short period of institutional treatment.

In four of the five dispensary areas, one of these pulmonary hospitals is in the charge of the consultant tuberculosis officer, an arrangement of the highest importance because patients come to these hospitals from the area administered by the tuberculosis officer, who is, therefore, conversant with the home conditions. Further, it is of great advantage to the tuberculosis officer, because he can himself apply certain forms of treatment and carry out valuable clinical and research work.

Other patients requiring isolation are accommodated in the pulmonary hospitals (not administered by the County Council) situated in or near the area. In order that the consultant tuberculosis officers may keep themselves in touch with such cases, arrangements have been made (with one or two exceptions, where only occasional County cases are treated) for the tuberculosis officers to visit periodically the pulmonary hospitals in their area and confer with the medical superintendents on the following matters:—(1) The question of extension of patients' treatment or their return home, having special regard to the home conditions which are known to the tuberculosis officer; (2) the question as to patients' future treatment; (3) applications from patients for transfer to other institutions, or for their discharge home, and to settle, where possible, any difficulties or complaints by patients which may arise.

The foregoing working arrangements have enabled the highly infectious cases with unsatisfactory home conditions to remain at the pulmonary hospitals for long periods for the purpose of isolation, and for patients who have made good progress and are capable of light work to be transferred to sanatoria for the continuation of their treatment.

By the Public Health Act of 1925, a County Council now has power to secure the compulsory isolation of infectious cases on the order of the magistrates, but so far it has not been necessary to exercise that power.

Brief particulars are given in the following Table 36 of the 14 pulmonary hospitals available for the treatment of County patients :—

Name of Hospital.	1929 : Number of Patients—		
	Admitted.	Discharged.	Died.
Burnley	32	10	4
Chadderton, near Oldham	102	61	37
Eccleston Hall, near St. Helens	7	7	2
Heath Charnock, near Chorley	46	31	18
Hefferston Grange, Cheshire	22	15	4
Linacre, near Liverpool	1	—	1
Marland, Rochdale	6	3	2
Mount Pleasant, Liverpool	1	—	—
Peel Hall, Little Hulton	143	101	38
Pemberton, Wigan	7	3	3
Rufford, near Ormskirk	85	84	7
Westhulme, Oldham	9	6	5
Withnell, near Chorley	99	65	38
Wolstenholme Hall, Norden	42	29	15
TOTAL	602	415	174

XXI.—INSTITUTIONAL ACCOMMODATION.

On the 31st December, 1929, there were altogether 874 beds at sanatoria and hospitals occupied by County patients, as compared with 858 at the end of 1928. The number of sanatorium beds occupied by pulmonary cases worked out at *one* per 5,473 of the population, and the number of pulmonary hospital beds *one* per 6,379.

Table 37 below gives a summary of the beds occupied at the end of 1929, at the several types of institutions, the names of which are contained in Appendix VIII.

Type of Institution.	Pulmonary Tuberculosis.		Non-Pulmonary Tuberculosis.		Total.
	Adults.	Children.	Adults.	Children.	
Sanatoria	276	45	—	8	329
Training Colonies	5	—	5	—	10
Pulmonary Hospitals	280	1	1	—	282
Observation Cases	5	3	1	2	11
General Hospitals	2	—	10	8	20
Special Hospitals	3	2	86	131	222
Total	571	51	103	149	874
	622		252		

Of the 874 beds occupied, 401 were in sanatoria or hospitals belonging to the County Council, and 473 were in non-County institutions.

The Wrightington Hospital, which will accommodate 226 cases of non-pulmonary tuberculosis (including special provision for 20 cases with also pulmonary tuberculosis), is now in course of construction.

The number of beds in occupation by County patients on the 31st December of each year is as follows :—1926, 825 ; 1927, 819 ; 1928, 858 ; and 1929, 874.

Of the 622 beds occupied at the end of 1929 by pulmonary patients, 81 per cent. of the cases were classified as " T.B. plus," that is, sometime during treatment their sputum was positive.

The number of beds occupied fluctuates during the course of the year, there being a greater demand for beds in the summer than in the winter. The list of patients waiting for institutional treatment, averaged at monthly periods during 1929, was as follows :—Sanatoria, adults 16, children 9 ; pulmonary hospitals, adults 60, children 2 ; special hospitals, adults 16, children 19 ; general hospitals, adults 10, children 4.

XXII.—HOME TREATMENT AND DISPENSARY TREATMENT OR SUPERVISION.

All notified cases of tuberculosis while at home are under the supervision of the tuberculosis officers and tuberculosis health visitors, in addition to the treatment that may be obtained from their medical attendants. Ordinary medical treatment at dispensaries (as distinct from special treatment such as artificial light and artificial pneumothorax) has never been undertaken, unless the patient has no doctor or requires some special form of treatment. The number of consultations with medical practitioners in 1929 was as follows : At the homes of patients, 982 ; otherwise, 4,732 ; total, 5,714.

The subject of this chapter was dealt with in the annual report for 1928, and there is no need to recapitulate in the present report.

XXIII.—TREATMENT AND OCCUPATIONAL TRAINING ; VILLAGE SETTLEMENTS.

The subject of this chapter was fully reviewed in the annual report for 1928.

The following table gives particulars of the patients so far granted a course of treatment combined with training :—

TABLE 38.

Classification on Admission.	TOTAL NUMBER ADMITTED.		Total Number Discharged.	Average duration of stay at Colony* (months).	PATIENTS DISCHARGED (1920 to 1929).			Still undergoing Training, 31st December, 1929.
	August, 1920 to Dec., 1928.	1929.			Course of Training completed.	Training terminated before completion of course.	Transfer to Sanatoria or Hospital.	
T.B. Minus ...	35	3	35	14·50	17	18	—	3
T.B. Plus 1 ...	24	—	24	16·00	8	14	2	—
T.B. Plus 2 ...	30	1	29	14·25	14	12	3	2
T.B. Plus 3 ...	3	—	3	12·00	1	2	—	—
Non-Pulmonary	5	1	1	—	—	1	—	5
Total.	97	5	92	14·75	40	47	5	10
	102							

* Average duration relates to patients who completed course.

APPENDIX I.

Death-Rates in 1929 from Tuberculosis in 119 Urban and Rural Districts in Lancashire, and in the 7 County Dispensary Areas.

SANITARY DISTRICT.	Estimated Population, 1929.	Pulmonary Tuberculosis.			Non-Pulmonary Tuberculosis.	
		Number of Deaths, 1929.	Death-Rate per 1,000 of Population, 1929.	*Average* Death-Rate 5 years, 1924–28.	Number of Deaths, 1929.	Death-Rate per 1,000 of Population, 1929
URBAN.						
Abram	6,957	4	0·57	0·61	—	—
Accrington (B)	44,220	22	0·49	0·65	6	0·13
Adlington	4,358	6	1·37	0·53	—	—
Ashton-in-Makerfield ...	22,660	6	0·26	0·51	5	0·22
Ashton-under-Lyne (B) ...	51,750	39	0·75	0·88	11	0·21
Aspull	7,551	1	0·13	0·76	—	—
Atherton	20,230	13	0·64	0·60	3	0·14
Audenshaw...	8,580	3	0·34	0·47	1	0·11
Bacup (B)	20,650	12	0·58	0·59	3	0·14
Barrowford...	5,476	3	0·54	0·46	2	0·36
Billinge and Winstanley ...	5,209	2	0·38	0·72	2	0·38
Blackrod	3,804	1	0·26	0·20	—	—
Brierfield	8,150	6	0·73	0·45	—	—
Carnforth	3,132	6	1·91	0·87	—	—
Chadderton...	28,390	18	0·63	0·73	5	0·17
Chorley (B)...	31,640	10	0·31	0·55	3	0·09
Church	6,547	3	0·45	0·68	3	0·45
Clayton-le-Moors	8,524	3	0·35	0·60	—	—
Clitheroe (B)	12,150	7	0·57	0·65	—	—
Colne (B)	24,850	16	0·64	0·62	10	0·40
Crompton	15,150	9	0·59	0·75	3	0·19
Croston	2,010	1	0·49	0·20	—	—
Dalton-in-Furness... ...	10,520	12	1·14	1·04	—	—
Darwen (B)	37,780	19	0·50	0·45	2	0·05
Denton	17,750	9	0·50	0·60	1	0·05
Droylsden	13,730	14	1·01	0·75	2	0·14
Eccles (B)	45,040	33	0·73	0·74	10	0·22
Failsworth	16,860	7	0·41	0·71	3	0·17
Farnworth	29,390	25	0·85	0·68	5	0·17
Fleetwood	21,990	10	0·45	0·78	4	0·18
Formby	7,599	3	0·39	0·58	—	—
Fulwood	6,711	—	—	0·43	—	—
Golborne	7,144	6	0·80	0·61	3	0·40
Grange-over-Sands ...	2,412	3	1·24	0·74	—	—
Great Crosby	17,010	7	0·41	0·67	4	0·23
Great Harwood	13,820	7	0·50	0·46	1	0·07
Haslingden (B)	17,120	5	0·29	0·48	5	0·29
Haydock	10,620	2	0·18	0·44	1	0·09
Heywood (B)	26,250	18	0·68	0·64	4	0·15
Hindley	23,650	26	1·09	0·70	4	0·16
Horwich	16,540	5	0·30	0·76	7	0·42
Huyton-with-Roby ...	5,174	5	0·96	0·56	—	—
Ince-in-Makerfield... ...	23,540	24	1·01	0·67	7	0·29
Irlam	12,190	11	0·90	0·67	1	0·08
Kearsley	10,130	10	0·98	0·83	—	—
Kirkham	4,166	8	1·92	0·91	—	—
Lancaster (B)	41,360	29	0·70	0·85	10	0·24
Lathom-and-Burscough ...	7,947	7	0·88	0·50	3	0·37
Lees	5,001	1	0·19	0·74	—	—
Leigh (B)	46,850	32	0·68	0·77	11	0·23
Leyland	10,370	2	0·19	0·57	—	—
Litherland	16,560	25	1·50	1·14	4	0·24
Littleborough	11,640	7	0·60	0·36	1	0·08
Little Crosby	1,185	—	—	0·30	—	—
Little Hulton	8,151	3	0·36	0·52	1	0·12
Little Lever	5,239	1	0·19	0·34	—	—
Longridge	4,189	3	0·71	0·42	—	—
Lytham-St.-Annes (B) ...	26,110	11	0·42	0·47	5	0·19
Middleton (B)	29,470	20	0·67	0·58	7	0·23
Milnrow	8,682	3	0·34	0·73	2	0·23
Morecambe & Heysham (B)	22,800	12	0·52	0·70	1	0·04
Mossley (B)...	12,210	6	0·49	0·53	5	0·40
Nelson (B)	39,760	29	0·72	0·55	3	0·07
Newton-in-Makerfield ...	19,990	24	1·20	0·78	4	0·20
Norden	4,396	4	0·90	0·65	2	0·45

APPENDIX I (contd.).

SANITARY DISTRICT.	Estimated Population, 1929.	Pulmonary Tuberculosis.			Non-Pulmonary Tuberculosis.	
		Number of Deaths, 1929.	Death-Rate per 1,000 of Population, 1929.	*Average* Death-Rate 5 years, 1924–28.	Number of Deaths, 1929.	Death-Rate per 1,000 of Population, 1929.
URBAN (contd.)						
Ormskirk	7,321	5	0·68	0·86	—	—
Orrell	7,241	—	—	0·47	3	0·41
Oswaldtwistle	14,840	5	0·33	0·46	2	0·13
Padiham	11,890	6	0·50	0·66	3	0·25
Poulton-le-Fylde	3,131	2	0·63	0·06	—	—
Preesall	2,028	—	—	0·83	—	—
Prescot	9,911	7	0·70	0·75	2	0·20
Prestwich	21,590	4	0·18	0·53	1	0·04
Radcliffe	25,450	14	0·55	0·55	4	0·15
Rainford	3,727	3	0·80	0·31	1	0·26
Ramsbottom	14,660	11	0·75	0·55	3	0·20
Rawtenstall (B)	28,660	15	0·52	0·62	7	0·24
Rishton	6,939	2	0·28	0·65	1	0·14
Royton	17,400	13	0·74	0·74	5	0·28
Skelmersdale	6,776	3	0·44	0·51	—	—
Standish-with-Langtree	7,524	5	0·66	0·41	3	0·39
Stretford	52,240	36	0·68	0·76	9	0·17
Swinton and Pendlebury	34,100	25	0·73	0·61	4	0·11
Thornton Cleveleys	9,614	3	0·31	0·42	—	—
Tottington	6,642	2	0·30	0·47	1	0·15
Trawden	2,716	—	—	0·28	—	—
Turton	12,310	5	0·40	0·54	—	—
Tyldesley-with-Shakerley	15,440	8	0·51	0·70	1	0·06
Ulverston	9,095	7	0·76	0·63	—	—
Upholland	5,812	1	0·17	0·27	1	0·17
Urmston	8,244	8	0·97	0·60	—	—
Walton-le-Dale	12,600	5	0·39	0·84	—	—
Wardle	4,612	1	0·21	0·47	—	—
Waterloo-with-Seaforth	31,840	29	0·91	1·00	4	0·12
Westhoughton	17,290	11	0·63	0·31	4	0·23
Whitefield	8,284	6	0·72	0·64	2	0·24
Whitworth	8,573	11	1·28	0·85	1	0·11
Widnes (B)	40,890	37	0·90	0·87	8	0·19
Withnell	3,316	1	0·30	0·40	—	—
Worsley	14,760	5	0·33	0·54	1	0·06
Total Urban	1,548,800	975	0·62	0·66	251	0·16
RURAL.						
Barton-upon-Irwell	13,500	6	0·44	0·68	1	0·07
Blackburn	11,290	3	0·26	0·52	—	—
Burnley	18,060	9	0·49	0·51	1	0·05
Bury	9,385	7	0·74	0·45	2	0·21
Chorley	22,440	13	0·57	0·44	4	0·17
Clitheroe	8,893	3	0·33	0·37	—	—
Fylde	15,980	10	0·62	0·31	1	0·06
Garstang	11,440	5	0·43	0·40	2	0·17
Lancaster	9,343	1	0·10	0·47	2	0·21
Leigh	11,980	12	1·00	0·62	—	—
Limehurst	9,203	3	0·32	0·59	2	0·21
Lunesdale	6,397	2	0·31	0·56	—	—
Preston	27,930	9	0·32	0·33	3	0·10
Sefton	2,371	—	—	0·92	—	—
Ulverston	16,630	4	0·24	0·67	1	0·06
Warrington	15,920	14	0·87	0·66	3	0·18
West Lancashire	23,270	13	0·55	0·47	2	0·08
Whiston	22,370	9	0·40	0·50	4	0·17
Wigan	6,498	4	0·61	0·46	—	—
Total Rural	262,900	127	0·48	0·50	28	0·10
Total for Administrative County	1,811,700	1,102	0·60	0·63	279	0·15
DISPENSARY AREAS.						
No. 1	261,465	122	0·45	0·58	37	0·13
No. 2	354,645	180	0·50	0·55	49	0·13
No. 3	375,658	230	0·61	0·66	68	0·18
No. 4	344,774	239	0·69	0·67	51	0·14
No. 5	374,567	272	0·72	0·68	68	0·18
Furness Sub-Area	38,657	26	0·67	0·77	1	0·02
Fylde Sub-Area	61,934	33	0·57	0·57	5	0·08

TABLES B, C AND D,

ANALYSING

NOTIFICATIONS UNDER PUBLIC HEALTH

(TUBERCULOSIS)

REGULATIONS, 1912—1924.

TABLE B.

ADMINISTRATIVE COUNTY OF LANCASTER.

PUBLIC HEALTH (TUBERCULOSIS) REGULATIONS, 1912—1924.

CORRECTED* SUMMARY OF NOTIFICATIONS OF PULMONARY AND OTHER FORMS OF TUBERCULOSIS DURING THE FIFTY-TWO WEEKS ENDED 28TH DECEMBER, 1929.

(Collated from Weekly Returns of District Medical Officers of Health.)

	NOTIFICATIONS ON FORMS A AND B—Excluding Duplicates.																																											Total Notifications (*i.e.*, including cases previously notified by other Doctors).
	PULMONARY.						NON-PULMONARY.																																				Total Pulmonary and Non-Pulmonary.	
							BONES AND JOINTS.																		ABDOMINAL.			GENITO-URINARY.										PERIPHERAL GLANDS.						
								Trunk.		Arm.							Leg.																											
	Lungs only.	Lungs and Larynx.	Larynx.	Bronchial Glands.	Mediastinal Glands.	TOTAL.	Head (including Middle Ear).	Ribs and Sternum.	Spine.	Shoulder.	Scapula.	Humerus.	Elbow.	Radius.	Ulna.	Hand and Wrist.	Hip and Pelvis.	Femur.	Knee.	Tibia.	Fibula.	Foot and Ankle.	Two or more different Joints.	Not Classified.	Intestines.	Peritoneum.	Mesenteric Glands.	Bladder.	Fall. Tube.	Kidney.	Prostate.	Suprarenal.	Testicle and Epididymis.	Not Classified (two or more).	MENINGITIS (Brain).	MILIARY (Generalised).	SKIN (Lupus).	Axillary.	Cervical.	Inguinal.	MISCELLANEOUS.	TOTAL.		
Thirteen weeks ended 30th March, 1929 ...	387	3	3	1	...	394	4	3	10	1	...	...	1	...	...	1	14	...	8	1	...	6	...	...	3	40	6	...	...	2	...	...	4	...	21	...	21	5	99	3	10	263	657	706
Thirteen weeks ended 29th June, 1929 ...	437	1	2	4	1	445	...	5	21	1	...	...	1	1	...	7	17	1	10	1	...	3	1	1	6	28	6	1	...	5	...	...	1	1	16	1	14	...	108	1	5	263	708	761
Thirteen weeks ended 28th September, 1929	370	2	4	...	...	376	...	1	16	1	...	...	...	1	...	4	17	1	8	...	...	8	1	2	...	37	2	2	...	...	...	1	3	1	5	1	12	1	72	1	10	208	584	631
Thirteen weeks ended 28th December, 1929	297	3	2	...	...	302	...	...	16	3	...	...	2	...	...	2	11	1	10	...	...	3	5	...	2	20	7	2	2	2	...	...	6	...	3	1	7	2	66	...	6	179	481	534
Total	1491	9	11	5	1	*1517	4	9	63	6	...	...	4	2	...	14	59	3	36	2	...	20	7	3	11	125	21	5	2	9	...	1	14	2	45	3	54	8	345	5	31	*913	*2430	2632

		NOTIFICATIONS ON FORMS A AND B—Excluding Duplicates.																											NOTIFICATIONS. FORM B ONLY. (By School Medical Officers.)										Number of Cases Notified on Form C. (Admissions).		Number of Cases notified on Form D (Discharges from Institutions).
		PULMONARY.													NON-PULMONARY.													Total Pulmonary and Non-Pulmonary.	PRIMARY NOTIFICATIONS. (*i.e.*, excluding duplicates).									Total Notifications (*i.e.*, including cases previously notified by other Doctors).	Public Assistance Hospitals.	Sanatoria.	
	Years.	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and upwds.	TOTAL.	TOTAL M. & F.	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and upwds.	TOTAL.	TOTAL M. & F.		Under 5 years.		5 to 10 years.		10 to 15 years.		TOTAL.						
																													P.	N.P.	P.	N.P.	P.	N.P.	P.	N.P.					
Thirteen weeks ended 30th March, 1929 ...	M.	2	3	6	4	20	23	44	53	42	18	4	219	394	7	32	36	19	15	9	10	8	3	2	2	143	263	657	...	...	...	4	...	2	...	6	9	9	4	218	246
	F.	...	2	7	9	25	34	48	26	14	6	4	175		1	12	28	14	15	13	21	5	6	5	...	120			...	...	1	...	1	1	2	1					
Thirteen weeks ended 29th June, 1929 ...	M.	...	3	16	7	20	31	46	48	45	21	8	245	445	8	27	25	19	15	14	6	5	6	2	1	128	263	708	...	...	3	1	...	1	3	2	9	9	3	350	242
	F.	...	3	7	5	34	40	47	33	13	8	10	200		1	16	26	18	17	14	16	15	6	5	1	135			...	...	...	1	...	3	...	4					
Thirteen weeks ended 28th September, 1929	M.	2	1	6	4	21	24	34	40	54	24	7	217	376	...	19	25	11	9	7	13	7	3	...	2	96	208	584	...	...	...	3	1	...	1	3	4	4	5	367	303
	F.	...	2	...	5	30	25	48	22	17	9	1	159		1	21	23	8	13	12	14	12	4	2	2	112			...	...	...	...	...	...	...	...					
Thirteen weeks ended 28th December, 1929 ...	M.	...	...	4	2	19	21	36	39	24	13	4	162	302	2	20	13	18	13	7	11	2	4	3	...	93	179	481	...	1	1	1	...	2	1	4	8	8	7	360	353
	F.	...	...	4	4	22	31	43	18	9	5	4	140		...	16	15	11	9	9	12	4	6	3	1	86			...	2	...	1	...	...	...	3					
Total	M.	4	7	32	17	80	99	160	180	165	76	23	843	*1517	17	98	99	67	52	37	40	22	16	7	5	460	*913	*2430	...	1	4	9	1	5	5	15	30	30	19	1295	1144
	F.	...	7	18	23	111	130	186	99	53	28	19	674		3	65	92	51	54	48	63	36	22	15	4	453			...	2	1	2	1	4	2	8					

*Corrected figures after deducting 61 Pulmonary and 44 Non-Pulmonary cases notified in error by practitioners.

TABLE C.

ADMINISTRATIVE COUNTY OF LANCASTER.

PUBLIC HEALTH (TUBERCULOSIS) REGULATIONS, 1912—1924.

ANALYSIS OF THE NOTIFICATIONS ON FORMS A AND B (EXCLUDING DUPLICATES) RECEIVED DURING THE FIFTY-TWO WEEKS ENDED 28th DECEMBER, 1929. († Corrected figures.)

(Collated from Weekly Returns of District Medical Officers of Health.)

	Age—Years.	...	0 — 1			1 — 5			5 — 10			10 — 15			15 — 20			20 — 25			25 — 35			35 — 45			45 — 55			55 — 65			65 & upwds.			TOTAL.			...
	Sex.	Col.	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	Col.
	PULMONARY—																																						
	Lungs only ...	1	4	...	4	7	7	14	31	17	48	14	23	37	79	110	189	96	130	226	159	185	344	176	97	273	161	52	213	73	28	101	23	19	42	823	668	1491	1
	Lungs and Larynx...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	1	2	2	4	1	...	1	2	...	2	...	...	...	6	3	9	2
	Larynx ...	3	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2	2	...	2	1	...	1	2	...	2	3	1	4	...	...	...	...	...	...	9	2	11	3
	Bronchial Glands	4	...	...	...	...	...	...	1	1	2	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1	5	4
	Mediastinal Glands	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	1	...	1	5
	PULMONARY TOTAL ...	6	4	...	4	7	7	14	32	18	50	17	23	40	80	111	191	99	130	229	160	186	346	180	99	279	165	53	218	76	28	104	23	19	42	843	674	†1517	6
	**Cases—Pulmonary and Non-Pulmonary combined* ...		2	...	2	3	1	4	6	...	6	...	2	2	2	3	5	1	1	2	1	6	7	4	...	4	1	...	1	1	...	1	...	...	...	21	13	34	
	NON-PULMONARY—																																						
BONES AND JOINTS	Head— (Incl. Middle Ear) ...	7	...	...	...	...	1	1	...	1	1	...	...	...	...	...	...	1	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	2	2	4	7
	Trunk—																																						
	Ribs and Sternum ...	8	...	...	...	...	...	...	...	2	2	1	...	1	1	...	1	2	...	2	...	...	...	...	1	1	...	1	1	...	1	1	...	...	...	4	5	9	8
	Spine ...	9	...	...	...	6	8	14	5	6	11	...	1	1	3	2	5	5	5	10	5	6	11	1	3	4	...	1	1	4	2	6	...	...	...	29	34	63	9
	Arm—																																						
	Shoulder ...	10	...	...	...	1	...	1	1	...	1	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	1	1	2	...	1	1	...	...	...	4	2	6	10
	Scapula ...	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11
	Humerus ...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12
	Elbow ...	13	...	...	...	...	1	1	1	...	1	...	...	...	...	1	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	4	13
	Radius ...	14	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2	14
	Ulna ...	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15
	Hand and Wrist ...	16	1	...	1	2	2	4	...	1	1	...	1	1	1	...	1	1	1	2	1	2	3	...	...	...	1	...	1	...	...	...	...	...	...	7	7	14	16
	Leg—																																						
	Hip and Pelvis ...	17	...	...	...	7	3	10	2	6	8	6	5	11	2	4	6	4	2	6	1	4	5	2	5	7	2	2	4	1	1	2	...	...	...	27	32	59	17
	Femur ...	18	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	...	1	1	...	...	...	...	...	...	...	...	...	...	3	3	18
	Knee ...	19	1	...	1	5	2	7	5	1	6	5	...	5	2	3	5	1	2	3	1	3	4	2	1	3	...	...	...	...	2	2	...	...	...	22	14	36	19
	Tibia ...	20	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2	20
	Fibula ...	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	21
	Foot and Ankle ...	22	...	...	...	2	1	3	3	2	5	1	...	1	1	1	2	1	1	2	...	1	1	1	2	3	1	1	2	...	...	...	...	1	1	10	10	20	22
	Two or more different Joints ...	23	...	...	...	...	1	1	...	...	...	1	...	1	2	1	3	...	...	...	1	...	1	...	...	...	1	...	1	...	...	...	...	...	...	5	2	7	23
	Not Classified ...	24	...	...	...	...	...	...	1	...	1	...	...	...	...	1	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	3	24
ABDOMINAL	Intestines ...	25	1	...	1	...	2	2	2	...	2	...	1	1	...	...	...	1	1	2	1	...	1	...	1	1	...	1	1	...	...	...	...	...	...	5	6	11	25
	Peritoneum ...	26	7	...	7	19	11	30	9	11	20	10	8	18	9	15	24	2	8	10	5	1	6	3	3	6	...	1	1	...	2	2	1	...	1	65	60	125	26
	Mesenteric Glands ...	27	1	...	1	1	1	2	...	1	1	2	4	6	1	1	2	...	1	1	2	2	4	...	1	1	1	1	2	1	...	1	...	...	...	9	12	21	27
GENITO-URINARY	Bladder ...	28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	2	1	1	2	...	...	...	...	...	...	...	...	...	2	3	5	28
	Fallopian Tube ...	29	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	29
	Kidney ...	30	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	1	1	1	2	...	2	2	3	...	3	...	...	...	...	...	...	6	3	9	30
	Prostate ...	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	31
	Suprarenal ...	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	1	32
	Testicle and Epididymis	33	...	...	...	1	...	1	1	...	1	...	...	...	2	...	2	2	...	2	4	...	4	2	...	2	1	...	1	...	...	...	1	...	1	14	...	14	33
	Not Classified ... (Two or more)	34	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	1	1	2	34
	MENINGITIS (Brain) ...	35	3	2	5	16	4	20	4	8	12	3	3	6	1	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	28	17	45	35
	MILIARY (Generalised) ...	36	...	...	...	...	...	...	1	...	1	...	...	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	3	36
	SKIN (Lupus) ...	37	...	...	...	2	1	3	6	3	9	5	1	6	2	1	3	1	3	4	3	6	9	4	7	11	2	4	6	...	2	2	...	1	1	25	29	54	37
PERIPHERAL GLANDS	Axillary ...	38	...	...	...	1	...	1	...	...	...	...	1	1	1	1	2	...	1	1	...	1	1	...	1	1	...	...	...	1	...	1	...	...	...	3	5	8	38
	Cervical...	39	1	1	2	31	25	56	54	46	100	29	25	54	18	21	39	11	19	30	11	31	42	3	4	7	1	8	9	...	3	3	1	2	3	160	185	345	39
	Inguinal ...	40	1	...	1	...	...	...	...	1	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	1	...	1	3	2	5	40
	MISCELLANEOUS ...	41	1	...	1	4	1	5	4	1	5	2	1	3	2	1	3	1	2	3	1	2	3	2	2	4	2	...	2	...	1	1	1	...	1	20	11	31	41
	NON-PULMONARY TOTAL ...	42	17	3	20	98	65	163	99	92	191	67	51	118	52	54	106	37	48	85	40	63	103	22	36	58	16	22	38	7	15	22	5	4	9	460	453	†913	42
	GRAND TOTAL ...	43	21	3	24	105	72	177	131	110	241	84	74	158	132	165	297	136	178	314	200	249	449	202	135	337	181	75	256	83	43	126	28	23	51	1303	1127	†2430	43

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* Combined cases are included in Pulmonary Total, but are shown separately for purpose of reference.

† Corrected figures after deducting 61 Pulmonary and 44 Non-Pulmonary cases notified in error by practitioners.

TABLE D.

ADMINISTRATIVE COUNTY OF LANCASTER.

PUBLIC HEALTH (TUBERCULOSIS) REGULATIONS, 1912—1924.

THE FOLLOWING TABLE COMPARES THE MALE AND FEMALE NOTIFIED CASES IN THE ADMINISTRATIVE COUNTY DURING THE YEARS 1913 TO 1929, AT CERTAIN AGE GROUPS :—

		PULMONARY TUBERCULOSIS.													NON-PULMONARY TUBERCULOSIS.												
	Sex.	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and upwds.	Total.	Total* M. & F.	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and upwds.	Total.	Total* M. & F.
1913	M	1	24	97	70	129	131	311	292	228	114	29	1426		29	128	177	137	98	58	71	48	27	18	3	794	
(11 months)	F	6	28	100	104	158	188	296	201	103	65	25	1274	2700	28	118	134	132	118	86	80	47	29	19	7	798	1592
1914	M	6	40	80	83	112	172	329	315	240	107	23	1507		43	111	131	95	77	36	47	23	20	14	3	600	
	F	3	32	115	107	140	181	336	225	107	47	20	1313	2820	37	88	98	89	77	44	58	27	12	6	4	540	1140
1915	M	5	47	97	79	127	138	305	303	235	117	34	1487		39	109	113	93	61	46	50	29	14	5	3	562	
	F	5	27	96	111	152	191	383	239	100	60	21	1385	2872	26	88	107	88	84	53	61	33	15	7	4	566	1128
1916	M	1	31	71	77	121	157	331	296	190	96	36	1407		20	127	135	99	65	42	47	34	12	13	5	599	
	F	2	24	81	96	165	186	345	220	98	52	13	1282	2689	8	68	122	114	85	46	65	41	19	11	2	581	1180
1917	M	4	20	77	62	113	104	262	268	190	90	30	1220		21	116	109	105	61	23	42	30	8	9	1	525	
	F	2	22	90	100	129	155	296	185	107	50	19	1155	2375	7	79	97	98	89	59	49	25	23	6	5	537	1062
1918	M	3	35	55	59	140	108	300	317	232	98	28	1375		14	75	103	65	60	19	29	16	14	7	2	404	
	F	1	24	69	74	139	166	297	207	117	52	13	1159	2534	10	75	84	92	80	46	46	29	9	6	4	481	885
1919	M	2	22	53	55	94	107	238	212	165	91	17	1056		13	50	97	80	53	26	31	22	19	12	4	407	
	F	5	14	54	80	126	161	261	184	99	41	24	1049	2105	10	59	98	76	61	43	41	29	11	7	5	440	847
1920	M	2	24	56	63	94	120	281	249	160	90	14	1153		31	62	107	108	68	26	35	23	16	11	5	492	
	F	2	20	53	71	115	122	264	147	84	36	17	931	2084	12	66	86	78	62	46	52	34	23	16	1	476	968
1921	M	1	17	43	47	94	133	222	225	162	84	19	1047		12	60	110	84	53	32	41	23	17	6	4	442	
	F	...	12	53	77	132	160	255	156	82	50	20	997	2044	15	62	89	81	65	41	53	15	21	9	6	457	899
1922	M	3	16	38	47	83	120	227	190	148	99	27	998		18	101	111	79	55	37	39	22	13	7	3	485	
	F	4	15	45	57	135	135	202	146	61	42	23	865	1863	13	77	80	95	61	45	50	24	14	7	5	471	956
1928	M	2	10	41	43	82	132	236	207	147	94	13	1007		18	115	134	105	75	35	45	22	14	15	6	584	
	F	1	14	43	60	115	149	251	149	83	49	16	930	1937	14	103	110	107	68	60	64	31	28	14	5	604	1188
1924	M	...	27	37	52	105	110	203	199	197	97	18	1045		19	123	92	92	95	35	43	25	17	12	3	556	
	F	3	12	29	55	144	139	223	169	94	49	10	927	1972	6	99	87	94	80	55	72	30	17	11	13	564	1120
1925	M	...	22	32	38	81	115	212	200	192	74	24	990		17	108	106	73	58	37	53	26	15	12	5	510	
	F	3	10	24	44	144	153	198	136	85	34	25	856	1846	9	86	84	91	82	41	57	33	18	10	6	517	1027
1926	M	1	9	27	40	91	113	210	198	158	110	23	980		10	90	97	76	75	29	35	32	16	7	3	470	
	F	2	12	41	47	114	169	224	120	68	38	13	848	1828	19	83	94	51	67	56	51	34	17	6	5	483	953
1927	M	1	11	47	39	115	111	197	187	185	85	19	997		12	101	131	87	66	38	40	18	13	4	7	517	
	F	...	13	37	49	129	128	195	113	71	51	11	797	1794	15	84	95	81	61	47	75	33	20	11	6	528	1045
1928	M	1	7	31	20	70	106	187	163	176	82	27	870		16	82	114	66	67	43	40	15	14	10	7	474	
	F	...	6	33	32	126	147	195	125	62	44	20	790	1660	13	69	100	70	56	63	50	27	21	8	5	482	956
1929	M	4	7	32	17	80	99	160	180	165	76	23	843		17	98	99	67	52	37	40	22	16	7	5	460	
	F	...	7	18	23	111	130	186	99	53	28	19	674	1517	3	65	92	51	54	48	63	36	22	15	4	453	913

---

* Corrected figures from 1922 after deducting the following cases found to be non-tuberculous and notifications cancelled :—1922 : 14 pulmonary, 12 non-pulmonary ; 1923 : 33 pulmonary, 31 non-pulmonary ; 1924 : 57 pulmonary, 38 non-pulmonary ; 1925 : 83 pulmonary, 49 non-pulmonary ; 1926 : 61 pulmonary, 41 non-pulmonary ; 1927 : 68 pulmonary, 51 non-pulmonary ; 1928 : 63 pulmonary, 52 non-pulmonary, and 1929 : 61 pulmonary, 44 non-pulmonary.

APPENDIX II.

NOTIFICATIONS OF TUBERCULOSIS.

Since February 1st, 1913, tuberculosis—both pulmonary and other forms—has been compulsorily notifiable under the Public Health (Tuberculosis) Regulations, 1912. The number of notifications made year by year since 1913 are given on page 3.

Tables B and C, here inserted, analyse the notifications received, iving the part of the body affected and the age-groups.

Table D, also inserted, compares the male and female notifications.

ABLE 39.—*Deaths of 318 persons notified as suffering from pulmonary tuberculosis in 1929 which took place within three months of the date of notification.*

Period between date of case notification and death.	Certified cause of Death.			Total.
	Pulmonary.		Non-Pulmonary	
	Primary	Secondary		
Under 1 week	75	4	8	87
1 to 2 weeks	28	1	2	31
2 to 3 weeks	26	3	—	29
3 to 4 weeks	22	3	—	25
1 to 2 months	81	3	4	88
2 to 3 months	55	2	1	58
Total under 3 months ...	287	16	15	318
	303			

Included in the above table are 30 deaths which occurred outside the County area.

In addition to the foregoing 318 deaths which occurred within three months of notification, in 25 instances (18 pulmonary and 7 non-pulmonary) death took place *before* the actual receipt of the notification, against 26 (8 pulmonary and 18 non-pulmonary) in the preceding year.

TABLE 40.—*Actual number of deaths from pulmonary and non-pulmonary tuberculosis since 1918 not previously notified under the Public Health (Tuberculosis) Regulations.*

Year.	Non-notified Fatal Cases.		
	Pulmonary Tuberculosis.	Non-Pulmonary Tuberculosis.	Total.
1918	303	137	440
1919	221	104	325
1920	177	122	299
1921	135	96	231
1922	105	83	188
1923	85	74	159
1924	64	65	129
1925	67	57	124
1926	58	32	90
1927	54	42	96
1928	56	51	107
1929	**62**	**61**	**123**

The 123 deaths in 1929 of cases not previously notified under the Regulations are further analysed below :—

TABLE 41.

	Cause of Death.			Total.
	Pulmonary.		Non-Pulmonary	
	Primary	Secondary		
Deaths of persons at private addresses	41	5	40	88
Deaths in County Mental Hospitals of persons belonging to County area ...	1	—	—	1
Deaths in Public Assistance Hospitals of persons belonging to County area ...	6	4	11	21
Deaths in other public institutions of persons belonging to County area...	4	1	10	15
	52	10		
Total...	62		61	123

During 1929, 103 pulmonary and 52 non-pulmonary deaths occurred outside the County area of persons usually residing in the Administrative County. Of these, 99 pulmonary and 49 non-pulmonary occurred in public institutions. In 60 instances no case notification could be traced. These are not included in Table 41.

N.B.—The Tables mentioned in Appendix II have been prepared in the County Public Health Department.

APPENDIX III.

Analysis of Cases on the Dispensary Registers on the 31st December, 1929.

(*a*) PULMONARY TUBERCULOSIS.

Age-Groups.	Sex.	T.B. Minus.		T.B. Plus 1.		T.B. Plus 2.		T.B. Plus 3.		TOTAL.	
		Active.	Quies.	Active.	Quies.	Active.	Quies.	Active.	Quies.	Active.	Quies.
0–5 years ...	M.	1	3	—	—	—	—	—	—	1	3
	F.	1	4	—	—	—	—	—	—	1	4
5–15 years ...	M.	58	149	2	1	5	1	1	—	66	151
	F.	57	133	3	2	6	—	2	—	68	135
15–25 years ...	M.	63	202	28	20	105	17	28	3	224	242
	F.	74	219	47	27	178	31	32	—	331	277
25–35 years ...	M.	54	143	82	66	156	30	29	1	321	240
	F.	76	176	48	36	181	27	19	1	324	240
35–45 years ...	M.	58	127	69	67	155	36	20	1	302	231
	F.	52	112	30	39	99	28	16	2	197	181
45–55 years ...	M.	65	121	48	57	151	31	23	—	287	209
	F.	49	87	17	18	64	16	8	1	138	122
55–65 years ...	M.	39	54	14	17	76	22	13	3	142	96
	F.	26	17	9	5	26	6	4	—	65	28
65 and over ...	M.	9	23	2	4	14	5	5	—	30	32
	F.	3	5	1	—	6	3	1	—	11	8
All Ages ...	M.	347	822	245	232	662	142	119	8	1373	1204
	F.	338	753	155	127	560	111	82	4	1135	995
GRAND TOTAL ...		2260		759		1475		213		4707	

(*b*) NON-PULMONARY TUBERCULOSIS.

Age-Groups.	Sex.	Bones and Joints (excluding Spine).		Spine.		Abdomen.		Other Organs.		Peripheral Glands.		Skin.		TOTAL.	
		Act.	Quies	Act.	Quies	Act.	Quies	Act.	Quies	Act.	Quies	Act.	Quies	Act.	Quies
0–5 years ...	M.	14	11	7	—	12	6	1	2	30	37	2	1	66	57
	F.	12	1	8	1	5	8	—	1	19	23	—	1	44	35
5–15 years ...	M.	69	82	40	21	28	68	3	6	101	252	29	13	270	442
	F.	58	44	28	20	18	45	4	7	97	250	23	10	228	376
15–25 years ...	M.	69	91	31	22	6	43	6	11	49	142	35	15	196	324
	F.	49	65	18	19	15	31	2	5	78	218	35	30	197	368
25–35 years ...	M.	18	42	16	11	5	11	10	10	17	31	22	14	88	119
	F.	25	24	20	10	7	21	6	8	37	92	16	19	111	174
35–45 years ...	M.	12	17	10	6	2	4	8	9	7	15	12	7	51	58
	F.	14	10	15	7	4	6	4	4	13	29	18	14	68	70
45–55 years ...	M.	13	6	4	2	1	—	3	3	2	8	7	2	30	21
	F.	7	9	5	5	2	—	1	2	9	12	21	18	45	46
55–65 years ...	M.	12	4	—	—	—	—	—	1	4	1	4	2	20	8
	F.	5	5	2	2	1	—	—	—	5	5	14	3	27	15
65 and over ...	M.	6	3	2	1	—	—	2	2	1	1	2	—	13	7
	F.	7	1	1	1	—	1	—	—	2	2	10	2	20	7
All Ages ...	M.	213	256	110	63	54	132	33	44	211	487	113	54	734	1036
	F.	177	159	97	65	52	112	17	27	260	631	137	97	740	1091
GRAND TOTAL ...		805		335		350		121		1589		401		3601	

APPENDIX IV.

HOUSING CONDITIONS OF PATIENTS IN EACH DISPENSARY AREA AT THE END OF 1929.

	Pulmonary cases considered infectious.		Pulmonary cases not considered infectious.		Non-Pulmonary cases.	
	Under 15 years.	15 years & over.	Under 15 years.	15 years & over.	Under 15 years.	15 years & over.
Patients occupying a separate bedroom :						
Area No. 1	1	166	22	132	40	93
Area No. 2	—	170	2	114	14	83
Area No. 3	1	308	4	173	19	89
Area No. 4	3	287	3	190	57	136
Area No. 5	1	235	14	194	25	97
Furness Sub-Area ...	—	29	10	52	5	26
Fylde Sub-Area ...	—	29	3	46	11	15
Total	6	1224	58	901	171	539
Patients occupying a separate bed but not a separate bedroom :						
Area No. 1	—	34	31	35	86	34
Area No. 2	4	135	3	63	82	80
Area No. 3	3	126	24	135	106	94
Area No. 4	—	102	25	77	114	97
Area No. 5	1	88	69	130	173	106
Furness Sub-Area ...	—	2	26	22	18	10
Fylde Sub-Area ...	2	15	9	37	41	15
Total	10	502	187	499	620	436
Patients not occupying a separate bed :		†				
Area No. 1	1*	8	25	118	115	151
Area No. 2	—	24	7	90	60	161
Area No. 3	—	15	27	192	134	287
Area No. 4	1*	12	13	215	122	227
Area No. 5	—	33	82	319	247	216
Furness Sub-Area ...	—	3	5	56	3	12
Fylde Sub-Area ...	—	5	7	62	46	54
Total	2	100	166	1052	727	1108
GRAND TOTAL ...	18	1826	411	2452	1518	2083

* This child was in a sanatorium at the end of 1929.

† Of the adult infective patients without a separate bed, there were in sanatoria or hospitals at the end of 1929 the following patients :—Area 1, 1 ; Area 2, 7 ; Area 3, 3 ; Area 4, 3 ; Area 5, 6 ; and Fylde Sub-Area, 1; Total, 21.

APPENDIX V.

Return showing the work of the Dispensaries during the year 1929.
(Table I of Memorandum 37/T of Ministry of Health).

DIAGNOSIS.	PULMONARY.				NON-PULMONARY.				TOTAL.			
	Adults.		Children.		Adults.		Children.		Adults.		Children.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
A.—NEW CASES examined during the year (excluding contacts):												
(*a*) Definitely tuberculous ...	591	493	30	30	152	219	196	158	743	712	226	188
(*b*) Doubtfully tuberculous	—	—	—	—	—	—	—	—	131	110	56	52
(*c*) Non-tuberculous... ...	—	—	—	—	—	—	—	—	787	757	352	283
B.—CONTACTS examined during the year:												
(*a*) Definitely tuberculous ...	8	20	3	4	—	2	5	4	8	22	8	8
(*b*) Doubtfully tuberculous	—	—	—	—	—	—	—	—	6	12	6	12
(*c*) Non-tuberculous ...	—	—	—	—	—	—	—	—	176	350	246	260
C.—CASES written off the Dispensary Register as:												
(*a*) Cured	133	112	9	9	101	115	69	83	234	227	78	92
(*b*) Diagnosis not confirmed or non-tuberculous (including cancellation of cases notified in error)... ...	—	—	—	—	—	—	—	—	1076	1210	647	596
D.—NUMBER OF PERSONS on Dispensary Register on December 31st, 1929:												
(*a*) Diagnosis completed ...	2356	1922	221	208	935	1148	835	683	3291	3070	1056	891
(*b*) Diagnosis not completed	—	—	—	—	—	—	—	—	8	6	7	5

1. Number of persons on Dispensary Register on January 1st, 1929. ...	8429
2. Number of patients transferred from other areas and of "lost sight of" cases returned	114
3. Number of patients transferred to other areas and cases "lost sight of"	521
4. Died during the year...	1039
5. Number of observation cases under A (*b*) and B (*b*) above, in which period of observation exceeded 2 months...	64
6. Number of attendances at the Dispensary (including Contacts), excluding attendances for light treatment	22495
7. Number of attendances of non-pulmonary cases at Orthopædic Out-stations for treatment or supervision	1638
8. Number of attendances, at General Hospitals or other Institutions approved for the purpose, of patients for	At County Dispensaries 37113 At Hospitals
(*a*) "Light" treatment	1843
(*b*) Other special forms of treatment at special hospitals	414

9. Number of patients to whom Dental Treatment was given, at or in connection with the Dispensary ...	23*
10. Number of consultations with medical practitioners:—	
(*a*) At Homes of Applicants ...	982
(*b*) Otherwise	4732
11. Number of other visits by Tuberculosis Officers to Homes ...	4769
12. Number of visits by Nurses or Health Visitors to Homes for Dispensary purposes	42844
13. Number of	
(*a*) Specimens of sputum, &c., examined	4341†
(*b* X-ray examinations made in connection with Dispensary work	5883
14. Number of Insured Persons on Dispensary Register on the 31st December, 1929.	4412
15. Number of Insured Persons under Domiciliary Treatment on the 31st December, 1929.	1353
16. Number of reports received during the year in respect of Insured Persons:—	
(*a*) Form G.P. 17	14
(*b*) Form G.P. 36	38

26 cases previously written off the register as cured have returned to treatment in 1929.

* In addition, 318 individual patients received dental attention whilst undergoing treatment in sanatoria or hospitals.

† In addition, 1,357 specimens were examined for medical practitioners in respect of persons whose names were not on the dispensary register at the date of the examination.

APPENDIX VI.

RESIDENTIAL INSTITUTIONS.

(A) AVERAGE NUMBER OF BEDS AVAILABLE FOR PATIENTS DURING THE YEAR 1929.

(Table II of Memorandum 37/T of Ministry of Health).

	Observation.	Pulmonary Tuberculosis.		Non-Pulmonary Tuberculosis.		Total.
		" Sanatorium " Beds.	"Hospital" Beds.	Disease of Bones and Joints.	Other Conditions.	
Adult Males	3	158	159	53	10	383
Adult Females	4	137	118	31	5	295
Children under 15	5	47	2	112	31	197
TOTAL	12	342	279	196	46	875

(B) RETURN SHOWING THE EXTENT OF RESIDENTIAL TREATMENT DURING THE YEAR 1929.

			In Institutions on Jan. 1.	Admitted during the year.	Discharged during the year.	Died in the Institutions.	In Institutions on Dec. 31.
Number of Patients ...	Adults	M.	369	788	649	139	369
		F.	286	614	524	77	299
	Children	M.	117	130	122	9	116
		F.	76	91	84	4	79
Number of Observation Cases	Adults	M.	3	34	34	1	2
		F.	2	30	26	—	6
	Children	M.	3	10	12	—	1
		F.	2	12	12	—	2
Total			858	1709	1463	230	874

APPENDIX VII.

Return showing the immediate results of treatment of patients and of observation of doubtful cases discharged from Residential Institutions during the year 1929.

(Table III of Memorandum 37/T of Ministry of Health).

	Classification on admission to the Institution.	Condition at time of discharge.	Duration of Residential Treatment in the Institution.												Total
			Under 3 months.			3—6 months			6—12 months			More than 12 months			
			M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	
Pulmonary Tuberculosis.	Class T.B. minus.	Quiescent	15	15	2	8	23	8	6	9	13	4	1	8	112
		Improved	18	12	5	17	19	3	16	5	8	4	8	2	117
		No material improvement...	13	14	3	5	—	1	1	1	1	1	1	2	43
		Died in Institution	9	7	1	2	—	—	—	—	—	—	1	—	20
	Class T.B. plus Group 1.	Quiescent	2	—	—	3	6	—	4	5	—	—	4	—	24
		Improved	13	—	—	8	5	—	6	8	—	3	2	1	46
		No material improvement...	6	1	—	3	2	1	4	3	1	1	1	—	23
		Died in Institution	2	3	1	1	1	—	—	—	—	—	1	—	9
	Class T.B. plus Group 2.	Quiescent	7	1	—	5	7	—	8	5	—	—	6	—	39
		Improved	67	17	—	82	48	—	36	36	2	23	25	—	336
		No material improvement...	31	27	—	19	20	—	16	16	—	7	4	—	140
		Died in Institution	38	16	1	14	17	—	17	8	—	6	3	—	120
	Class T.B. plus Group 3.	Quiescent	1	1	—	1	—	—	—	2	—	—	—	—	5
		Improved	8	4	—	9	6	—	11	8	—	2	4	—	52
		No material improvement	23	7	—	5	7	—	8	2	—	4	4	—	60
		Died in Institution	32	12	—	6	2	—	4	1	—	3	3	—	63
Non-Pulmonary Tuberculosis.	Bones & Joints.	Quiescent or Arrested ...	3	2	6	—	—	7	1	—	7	1	—	18	45
		Improved	17	24	11	9	9	8	7	2	3	14	6	12	122
		No material improvement...	6	6	5	2	1	—	2	1	1	—	1	2	27
		Died in Institution... ...	2	2	3	—	—	—	1	—	1	—	—	—	9
	Abdominal.	Quiescent or Arrested ...	—	4	—	1	1	3	—	—	3	1	2	2	17
		Improved	6	7	5	—	—	2	1	—	—	—	—	1	22
		No material improvement...	1	2	4	2	—	1	1	—	—	—	—	1	12
		Died in Institution	1	—	5	—	—	—	—	—	—	—	—	—	6
	Other Organs.	Quiescent or Arrested ...	—	—	—	—	—	—	—	1	1	—	—	—	2
		Improved	14	12	—	—	1	—	—	—	—	—	—	—	27
		No material improvement...	3	1	—	—	—	—	—	—	—	—	—	—	4
		Died in Institution... ...	—	—	1	—	—	—	—	—	—	—	—	—	1
	Peripheral Glands.	Quiescent or Arrested ...	5	10	7	—	—	1	1	—	2	—	—	2	28
		Improved	16	25	25	—	2	—	1	—	1	—	—	1	71
		No material improvement ...	—	2	2	—	—	—	—	—	—	—	—	1	5
		Died in Institution	1	—	—	—	—	—	—	—	—	—	—	—	1
			Under. 1 week			1—2 weeks.			2—4 weeks.			More than 4 weeks.			
	Observation for purpose of diagnosis.	Tuberculous	2	1	—	1	1	2	2	2	3	11	7	7	39
		Non-tuberculous	—	1	—	2	1	—	5	3	2	11	10	7	42
		Doubtful	—	—	—	—	—	1	—	—	—	—	—	2	3
		Died*	—	—	—	—	—	—	1	—	—	—	—	—	1

*The diagnosis in this case was :—Pelvic cellulitis following diverticulitis.

APPENDIX VIII.

INSTITUTIONAL ACCOMMODATION.

The following table shows the number of beds occupied by County patients undergoing residential treatment for pulmonary and non-pulmonary tuberculosis on the 31st December, 1929 :—

Institution.	Pulmonary Tuberculosis.		Non-Pulmonary Tuberculosis.		Total.
	Adults.	Children.	Adults.	Children.	
(*a*) *Sanatoria.*					
Aitken, near Bury	50	—	—	—	50
Bowdon, Cheshire	—	1	—	—	1
East Lancashire, Cheshire	44	—	—	—	44
Elswick, near Kirkham	36	3	—	—	39
Halifax (Shelf)	13	—	—	—	13
High Carley, near Ulverston	87	1	—	—	88
King Edward VII, Sussex	1	—	—	—	1
King George V, Hants. (for sailors) ...	1	—	—	—	1
Marrilac, Essex	1	—	—	—	1
Meathop, Grange-over-Sands	31	—	—	—	31
Ventnor, Isle of Wight	1	—	—	—	1
Wilkinson, Bolton	11	—	—	—	11
Total	276	5	—	—	281
(*b*) *Children's Sanatoria.*					
Eastby, near Skipton	—	22	—	7	29
Oubas House, Ulverston	—	18	—	1	19
Total	—	40	—	8	48
c) *Training Colonies.*					
Burrow Hill, Surrey	2	—	—	—	2
Derwen Cripples' College, Oswestry ...	—	—	4	—	4
Papworth Hall, Cambridge	—	—	1	—	1
Preston Hall, Kent	3	—	—	—	3
Total	5	—	5	—	10
(*d*) *Pulmonary Hospitals.*					
Burnley	17	—	—	—	17
Chadderton, near Oldham	42	—	—	—	42
Eccleston Hall, St. Helens...	4	—	—	—	4
Heath Charnock, Chorley	31	—	—	—	31
Hefferston Grange, Cheshire	9	—	—	—	9
Mount Pleasant, Liverpool	2	—	—	—	2
Marland, Rochdale	5	—	—	—	5
Peel Hall, Little Hulton	55	—	—	—	55
Pemberton, Wigan	4	—	—	—	4
Rufford, near Ormskirk	40	1	—	—	41
Westhulme, Oldham	1	—	—	—	1
Withnell, near Chorley	45	—	1	—	46
Wolstenholme Hall, Norden	25	—	—	—	25
Total	280	1	1	—	282
(*e*) *Observation Cases* (*Pulmonary*).					
Burnley Pulmonary Hospital	1	—	—	—	1
Chadderton Pulmonary Hospital ...	1	—	—	—	1
Elswick Sanatorium	1	—	—	—	1
High Carley Sanatorium	2	—	—	—	2
Oubas House Sanatorium	—	2	—	—	2
Rufford Pulmonary Hospital	—	1	—	—	1
Total	5	3	—	—	8

APPENDIX VIII.

INSTITUTIONAL ACCOMMODATION (contd.).

Institution.	Pulmonary Tuberculosis.		Non-Pulmonary Tuberculosis.		Total.
	Adults.	Children.	Adults.	Children.	
(*f*) *General Hospitals.*					
Ancoats Hospital, Manchester	—	—	1	—	1
Ashton-under-Lyne Infirmary	1	—	1	—	2
Blackburn Royal Infirmary	—	—	—	1	1
Bootle Borough Hospital	—	—	1	—	1
Manchester Royal Infirmary	—	—	1	2	3
Preston Royal Infirmary	1	—	4	1	6
Warrington Infirmary	—	—	1	2	3
Wigan Infirmary	—	—	1	2	3
Total	2	—	10	8	20
(*g*) *Special Hospitals.*					
East Lancashire, Cheshire	1	—	3	—	4
Elswick, near Kirkham	—	—	23	1	24
Fazakerley, Liverpool	1	—	—	—	1
Rufford, near Ormskirk	—	—	8	1	9
Shropshire Orthopædic, Oswestry ...	1	—	52	2	55
Total	3	—	86	4	**93**
(*h*) *Children's Non-Pulmonary Hospitals.*					
Alton, Hants. (Lord Mayor Treloar Cripples' Hospital)	—	—	—	20	20
Coleshill (Warwickshire Orthopædic Hospital for Children)	—	1	—	19	20
Leasowe (Liverpool Open-air Hospital for Children)	—	—	—	30	30
Pendlebury (Royal Manchester Children's Hospital)	—	—	—	4	4
Royal Liverpool Children's Hospital —					
Heswall, Cheshire	—	—	—	11	11
Myrtle Street, Liverpool	—	—	—	2	2
Sheffield (King Edward VII Hospital for Crippled Children)	—	1	—	11	12
United Services Fund—					
Heatherwood, Berks.	—	—	—	20	20
Melton Lodge, Great Yarmouth ...	—	—	—	4	4
West Kirby (Children's Convalescent Home)	—	—	—	6	6
Total	—	2	—	127	129
(*i*) *Observation Cases* (*Non-Pulmonary*).					
Manchester Royal Infirmary	—	—	1	—	1
Warwickshire Orthopaedic Hospital for Children	—	—	—	2	2
Total	—	—	1	2	3
GRAND TOTAL ...	571	51	103	149	874
	622		252		